

3 9999 06317 729 7

169

WOODCOCK STATUS REPORT

1972



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
Special Scientific Report—Wildlife No. 169



UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife

WOODCOCK STATUS REPORT, 1972

Eldon R. Clark

Office of Migratory Bird Management
Laurel, Maryland



Bureau of Sport Fisheries and Wildlife
Special Scientific Report--Wildlife No. 169
Washington, D.C. . 1973

CONTENTS

Abstract	iv
Introduction	1
Singing-Ground Survey	
Procedures	3
Results	6
Wing-Collection Survey	
Procedures	7
Results	8
Comparison of sample source	8
Weighting factors	9
Productivity index	9
Hunter success index	12
Regional analysis of wing-collection data	
Sex and age ratios	13
Timing of harvest	14
Summary of Research Activities	15
Acknowledgments	20
References	21
Appendix	23

ABSTRACT

There is evidence that the woodcock harvest and the number of participating hunters have increased substantially since 1964, with the U.S. harvest in 1970-71 exceeding 1.3 million birds. Information on the current status and population trend of the American woodcock is provided by annual singing-ground surveys over much of the species' breeding range, and by wing-collection surveys in the eastern United States. The 1972 singing-ground survey showed breeding population index increases of 1.6 percent in the Atlantic Region, 3.7 percent in the Central Region, and 2.7 percent rangewide. These indexes are based upon 813 comparable, randomly selected survey routes--4 percent fewer than the record 848 routes in 1971.

The wing-collection survey for the 1971-72 season suggested the greatest 1-year change in productivity in the history of the survey--a 27 percent decline; this followed a substantial increase of 25 percent the preceding year. Both daily bag per hunter and the average season bag decreased slightly.

Woodcock research is increasing, with present emphasis on more banding on breeding grounds. Limited band recoveries to date suggest little interchange between Atlantic Region and Central Region breeding populations.

THE STATUS OF AMERICAN WOODCOCK - 1972

INTRODUCTION

The American woodcock (Philohela minor) has become a popular game bird with increasing numbers of hunters over a wider portion of its range during the past decade. The species still rates well below waterfowl on the migratory game bird list, but the woodcock-to-waterfowl harvest ratio has narrowed to 1:3, or less, in several northern States. Although State harvest surveys and the Bureau's waterfowl hunter mail survey show considerable variations in annual woodcock harvests, the general trend is upward. Thus, the species has advanced from a "specialty" game bird highly regarded by a few hunters to a broader based source of recreation.

In the United States, no suitable sampling frame exists upon which to conduct an annual woodcock harvest survey such as is undertaken for waterfowl. Since 1964, the Bureau's waterfowl hunter questionnaire survey has provided data on the numbers of woodcock harvested by waterfowl hunters (MacDonald and Martin, 1971). Comparisons are made in table 1 of the number and rate of increase of (1) waterfowl hunters, (2) waterfowl hunters who hunted woodcock, and (3) woodcock harvested by waterfowl hunters, by woodcock reference areas of the United States (fig. 1). However, the waterfowl hunter survey samples only 10 percent of all licensed hunters. The only measure of the woodcock harvest by the remaining 90 percent is in those States which conduct game harvest questionnaire surveys which include a question about the number of woodcock harvested. Data from the few such surveys cannot be combined because of sampling and procedural differences.

A comparison of woodcock data from reliable surveys in two representative States, Michigan and New York, with those from the Bureau waterfowl hunter questionnaire survey in the same States indicates that harvest estimates from the latter survey averaged about 45 percent of the harvests indicated by State surveys (table 2). Thus, it appears that doubling the woodcock reported bagged by waterfowl hunters provides a conservative estimate of the total U.S. harvest. The resulting figure of 1.3 million woodcock harvested in the 1970-71 season represents an increase of approximately 50 percent over a 5-year period. This is a crude estimate at best. But it provides some idea of the utilization of the resource.

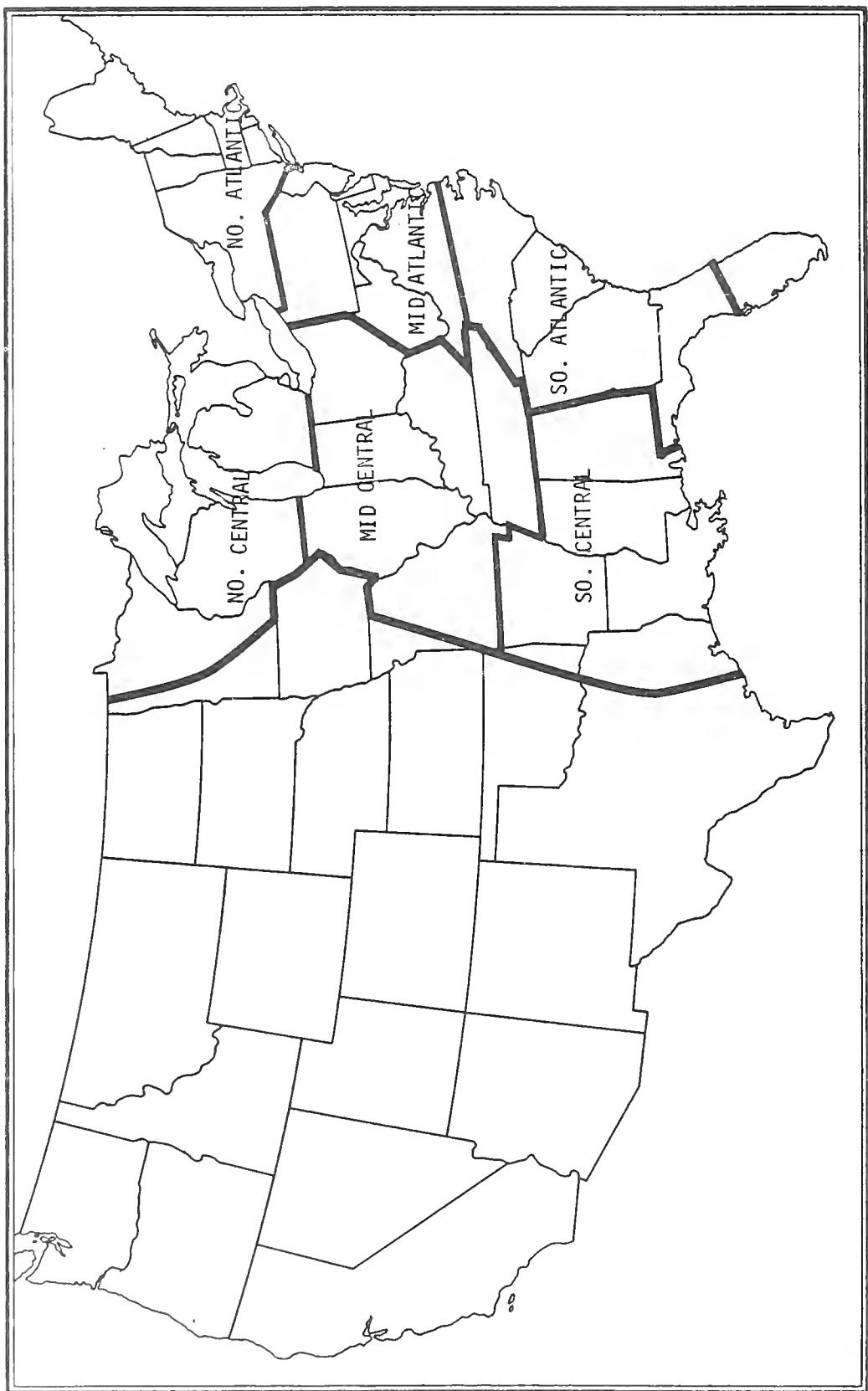


Figure 1.--Reference areas of U.S. woodcock surveys.

In Canada, all migratory game bird hunters are required to obtain Federal permits. Thus, in recent years, woodcock harvests in Canada have been monitored better than has been possible for those in the United States. The Canadian surveys indicate that the woodcock harvest increased from about 90,000 in 1967 to 100,000 in 1968, and to 116,000 in 1969. The harvest declined to 98,000 in 1970 when the New Brunswick season was closed and hunting was curtailed in other areas because high levels of DDT metabolites were detected in a preseason sample of woodcock (Benson, 1968, 1969, 1970, 1971).

The above figures suggest that the continental woodcock harvest currently approaches 1.5 million birds annually--and is increasing. Relatively little woodcock research has been accomplished, and much needs to be learned of its potential for meeting further recreational demands.

Two annual surveys presently comprise the basis for the establishment of woodcock hunting regulations: (1) A singing-ground survey provides an index of the post-migration breeding population; and (2) a wing-collection survey provides data on relative reproductive success of the species the previous breeding season, and changes in size and distribution of the harvest by survey participants.

The collection and analysis of data have steadily improved in both surveys. Although they are imperfect, these surveys produce the best information currently available for managing woodcock. This report presents data from the 1972 singing-ground survey, the 1971-72 wing-collection survey, and additional information accumulated since publication of the 1971 woodcock status report (Clark, 1972).

SINGING-GROUND SURVEY

Procedures

The singing-ground survey, which enumerates singing males heard along predetermined routes (table 3), is used as an index to the size of the breeding population. Analysis of these and other data from intensive research on the breeding grounds should increase our ability to relate singing-ground survey results to actual breeding populations. At present, the index is our sole measure of the woodcock breeding population.

Between 1964 and 1970, the basis of the survey gradually changed from routes selectively located in woodcock habitat of average or better quality (management routes) to randomly located routes covering habitat of all levels of quality (Clark, 1970). Because the conversion from management routes to random routes was 90 percent complete in 1969, the 1970 survey provided comparable random sample data for 2 consecutive years from most of the woodcock's breeding range. Beginning in 1970, comparable breeding population indexes for the breeding range of the woodcock are based entirely upon random routes.

The 1972 indexes are based on 813 comparable routes, 4 percent fewer than the high of 848 in 1971. In computing the indexes, data from each State were weighted according to the State's proportion of the total land area (inland water area excluded) in the region or in the range of the species (table 4).

On some routes, no singing males were heard at any of the 10 stops. Routes showing "0" results for 2 consecutive years under comparable circumstances are placed on the "Constant 0" list. They are included in the number of comparable routes, but are not field-checked annually; they will be checked at 5-year intervals to determine if woodcock are present.

Because the group of routes paired with comparable routes the preceding year to determine percent change is not necessarily the same group paired with comparable routes the subsequent year, it is illogical to graphically depict numbers of singing birds heard per route. Also, the conversion to random routes, which usually averaged fewer birds than management routes, precludes portraying the annual average number of birds per route. Therefore, the number of woodcock heard per comparable route, as shown in figure 2, was calculated as follows:

1. Determine the percent difference in number of woodcock heard per comparable route between the 1969 and the 1970 surveys.
2. Apply that percentage to the 1970 (base year) average number of woodcock heard per comparable route to obtain an adjusted figure for 1969.
3. Apply the percent difference between 1968 and 1969 (as shown in the 1969 report) to the adjusted 1969 figure to obtain an adjusted figure for 1968.

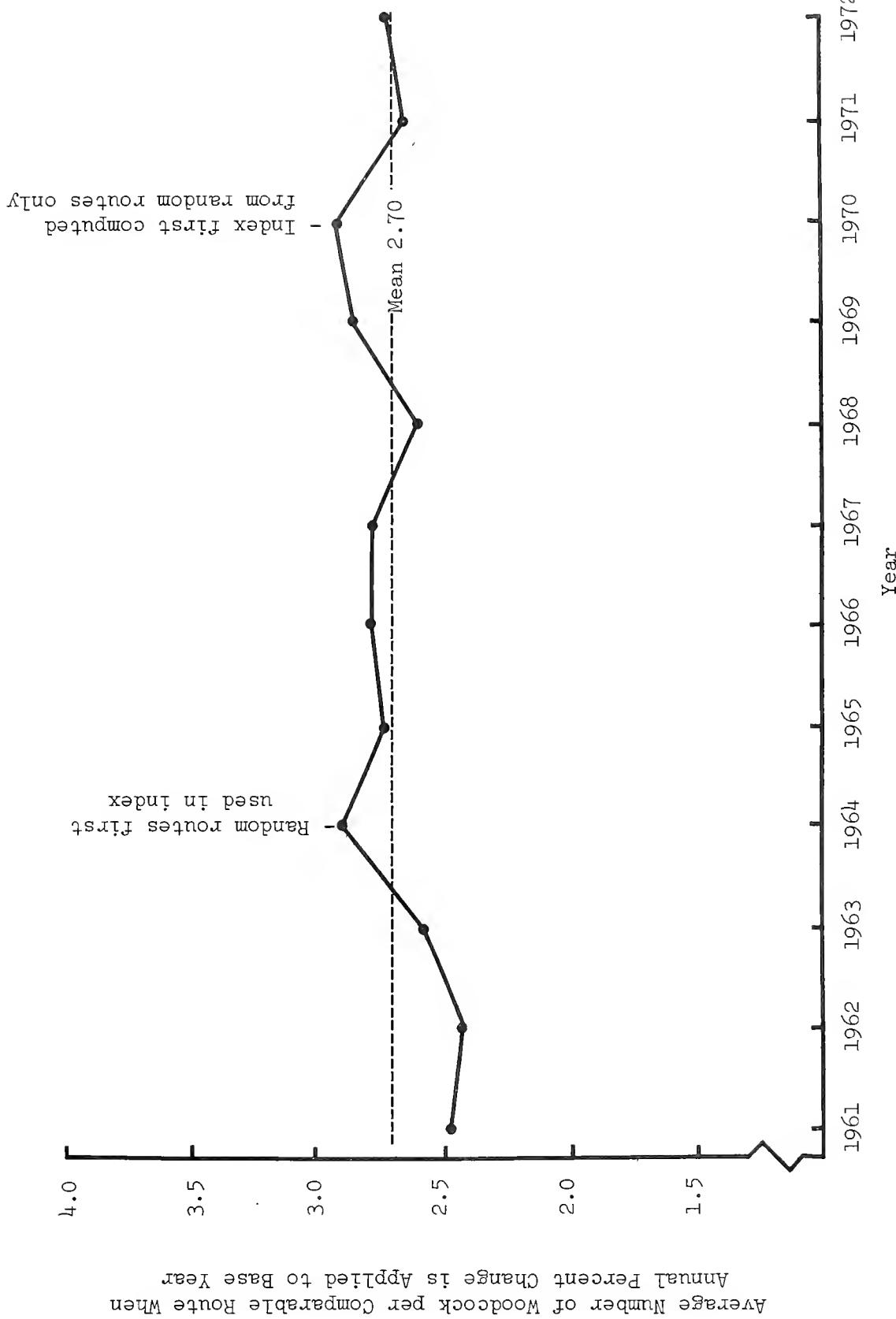


Figure 2.—Trends in singing male woodcock as determined from annual singing-ground surveys (Base year = 1970)

4. Do the same for each year, working back to the beginning of the index period, then forward to the end of the period.
5. Graph the adjusted figures for the index years, rather than the figures actually recorded each of these years.

Results

The 1972 survey showed a 1.59 percent increase from 1971 in the number of woodcock heard per comparable route in the Atlantic Region, and 3.67 percent in the Central Region. When the data were weighted on a rangewide basis, the index showed an increase of 2.73 percent. Following is a summary of the annual changes for the past 8 years, based on data weighted regionally and rangewide.

<u>Year</u>	<u>Percent Change from Previous Year</u>		
	<u>Atlantic Region</u>	<u>Central Region</u>	<u>Rangewide</u>
1965	-0.4	-11.1	-6.5
1966	+2.4	-0.5	+1.7
1967	+1.5	-3.5	0
1968	-8.4	-4.5	-6.9
1969	+4.2	+12.1	+8.8
1970	0	+3.1	+2.1
1971	-9.8	-7.3	-8.4
1972	+1.6	+3.7	+2.7

Up to 1964 the breeding population trend was upward, and since then annual changes have been generally compensatory (fig. 2).

WING-COLLECTION SURVEY

The woodcock wing-collection survey was initiated in the United States in 1959. The primary objective is to determine woodcock reproductive success as reflected by the age and sex composition of the harvest. The survey also produces information on changes in geographic and chronologic distribution and size of the harvest. Numbered and dated envelopes are used for each day's bag, so it is possible to determine both daily and seasonal hunter success.

Response to the wing-collection survey has been generally good since its inception in 1959. Annual wing submissions have ranged from 8,786 the first year to 19,165 in the 1971-72 season, averaging 14,463 annually for the 13-year period.

Procedures

The procedures for collecting and processing wings, and analyzing data, were the same as for the 1968-69 season (Clark, 1970).

Because we lack a uniform method for sampling woodcock hunters, it is necessary to use several sources of names and addresses in assembling a mailing list for prospective participants in the wing-collection survey. To facilitate data analysis, each source is given a code number as follows:

Code 1 - Previous years' Code 1, 2, 4, 7, and 8 hunters who submitted wings.

Code 2 - Waterfowl mail survey hunters who reported hunting woodcock.

Code 4 - Hunters who ask to participate or are proposed by a fellow hunter.

Code 7 - Hunters who appear on both Code 1 and Code 9 lists.

Code 8 - Previous years' Code 9 hunters who submitted wings.

Code 9 - Hunters on a list provided by a State from its harvest survey (except in New Jersey, where list was from woodcock hunting stamp purchasers).

The distribution of contacts by States is shown in table 5. A total of 8,593 hunters was contacted in the 1971-72 woodcock survey, 10 percent more than the previous high of 7,800 in 1969-70. To improve the distribution of the wing sample, more hunters in mid-latitude and southern States have been contacted in recent years (table 6). Adequate samples are readily available from most northern States.

Hunters who cooperated in previous years (Code 1) submitted the most wings and were the sole source of comparable data. Lists of hunters' names and addresses obtained from State harvest surveys (Code 9) probably produce the least biased samples within each State; however, procedural variations between States introduce additional biases. Also, many States either have no harvest survey or do not inquire about woodcock in their questionnaires. Code 4 names added annually at the request of survey participants or their friends are few. The list of woodcock hunters from the Bureau's waterfowl mail survey (Code 2) is the largest source of names, but the number of wings submitted per contact is very low. A significant bias in this source is the large State-to-State variation in the ratio of waterfowl hunters to total hunters. For example, both Louisiana and Pennsylvania are important woodcock harvest States. However, only one Pennsylvania hunter in 20 purchases a duck stamp; in Louisiana, one-third of all hunters purchase duck stamps. Obviously, precise analysis of a survey sample originating from such varied sources is impossible. However, major changes in woodcock productivity and harvest rates probably can be detected.

Results

The number of wings received increased from 18,385 in 1970-71 to 19,165 in 1971-72. Wing totals vary slightly between different tables in this report because incomplete information necessitated excluding a few wings from some tabulations.

Table 7 shows a listing by States of the number of cooperators, envelopes, and wings received for the past three hunting seasons. Numbers of envelopes are shown because each envelope represents 1 day's hunt by one hunter, and consequently is the bag per successful day.

Comparison of sample source.--Table 8 shows the response rate and wings contributed by hunters in the three principal categories. Code 1 and Code 9 data overlap slightly because both include Code 7 data. Except for the steady decline in Code 2 response rate, weighted averages from 1971-72 in this comparison were similar to those from the preceding three seasons, as indicated in the following summary:

		<u>Code 1</u>	<u>Code 2</u>	<u>Code 9</u>
Percent response	1968-69	61.1	18.4	13.9
	1969-70	58.6	16.5	14.3
	1970-71	58.8	14.0	13.1
	1971-72	58.6	11.1	11.5
Wings received per contact	1968-69	8.0	0.9	0.7
	1969-70	6.3	0.7	0.7
	1970-71	6.6	0.6	0.8
	1971-72	6.5	0.5	0.8
Wings received per contributor	1968-69	13.2	4.8	4.9
	1969-70	10.8	4.0	5.2
	1970-71	11.3	4.0	6.2
	1971-72	11.1	4.2	6.5

Two States provided representative sample hunter lists for the fourth consecutive year. Data from wings contributed by these hunters were compared with data provided by other hunters to determine if any group showed a tendency to hunt earlier in the season, and if the age ratio of their birds differed materially from the average (table 9). Either or both of these factors could influence the age ratio determined from the survey. Results were inconsistent, but additional years' data may clarify the effects of source of hunters' names on survey results. More State lists have been solicited for the 1972-73 season.

Weighting factors.--Because the number of wings received from each State usually was not proportional to the woodcock harvest in that State, it was necessary to weight data used in computing overall productivity and harvest index trends.

Because we lack a uniform sampling frame for woodcock hunters, no completely satisfactory weighting method has been devised. The current procedure is based upon a combination of data from the Bureau's waterfowl mail survey, duck stamp sales, and State license sales (Clark, 1970). The derivation of weighting factors for computing productivity and harvest indexes for the 1971-72 season is shown in table 10.

Productivity index.--In this report, reproductive success is used as a measure of annual productivity. Woodcock can be aged and sexed by wing plumage characters (Martin, 1964). The ratio of immatures to adult females in the harvest, as determined from the wing-collection survey, provides a measure of reproductive success during the preceding breeding

season (table 11). Considerable variation occurs in immature-adult female ratios between different harvest areas (States or Provinces), and between different years for the same harvest areas. These variations are probably caused by differences in hunting season dates, weather conditions, hunting season restrictions imposed by emergency situations (such as fire hazard), and possibly differential migration coupled with differential vulnerability to hunting among sex and/or age groups. However, prior to the 1970-71 season, the annual change in age ratios was small when rangewide data were weighted and combined (fig. 3). The greatest fluctuations to date occurred in the last 2 years--a 25.0 percent increase in 1970-71 followed by a 26.9 percent decline in 1971-72 (table 12).

The cause of the unusual fluctuations in age ratio has not been determined. Adverse weather when chicks are most vulnerable shortly after hatching may be a factor. Examination of climatological data for May (when most woodcock hatch) in States having the greatest density of breeding woodcock shows that average temperatures were above normal in 1970 and below normal in 1971 (U.S. Dept. of Commerce, 1970 and 1971):

	<u>1970</u> (25.0% increase in age ratio)	<u>1971</u> (26.9% decrease in age ratio)
ATLANTIC REGION (25 weather divisions)		
Average departure from normal	$+1.12^{\circ}$	-1.58°
Temperature range	-1.4° to $+3.1^{\circ}$	-3.9° to $+1.4^{\circ}$
Number divisions above normal	22	2*
Number divisions normal	1	1
Number divisions below normal	2**	22
CENTRAL REGION (25 weather divisions)		
Average departure from normal	$+0.62^{\circ}$	-2.38°
Temperature range	-3.4° to $+3.2^{\circ}$	-4.4° to -0.2°
Number divisions above normal	17	0
Number divisions normal	0	0
Number divisions below normal	8***	25

*Coastal Maine and New York's St. Lawrence valley

**Northern Maine and northwestern Vermont

***Northern Minnesota, northern Wisconsin, and Michigan's Upper Peninsula

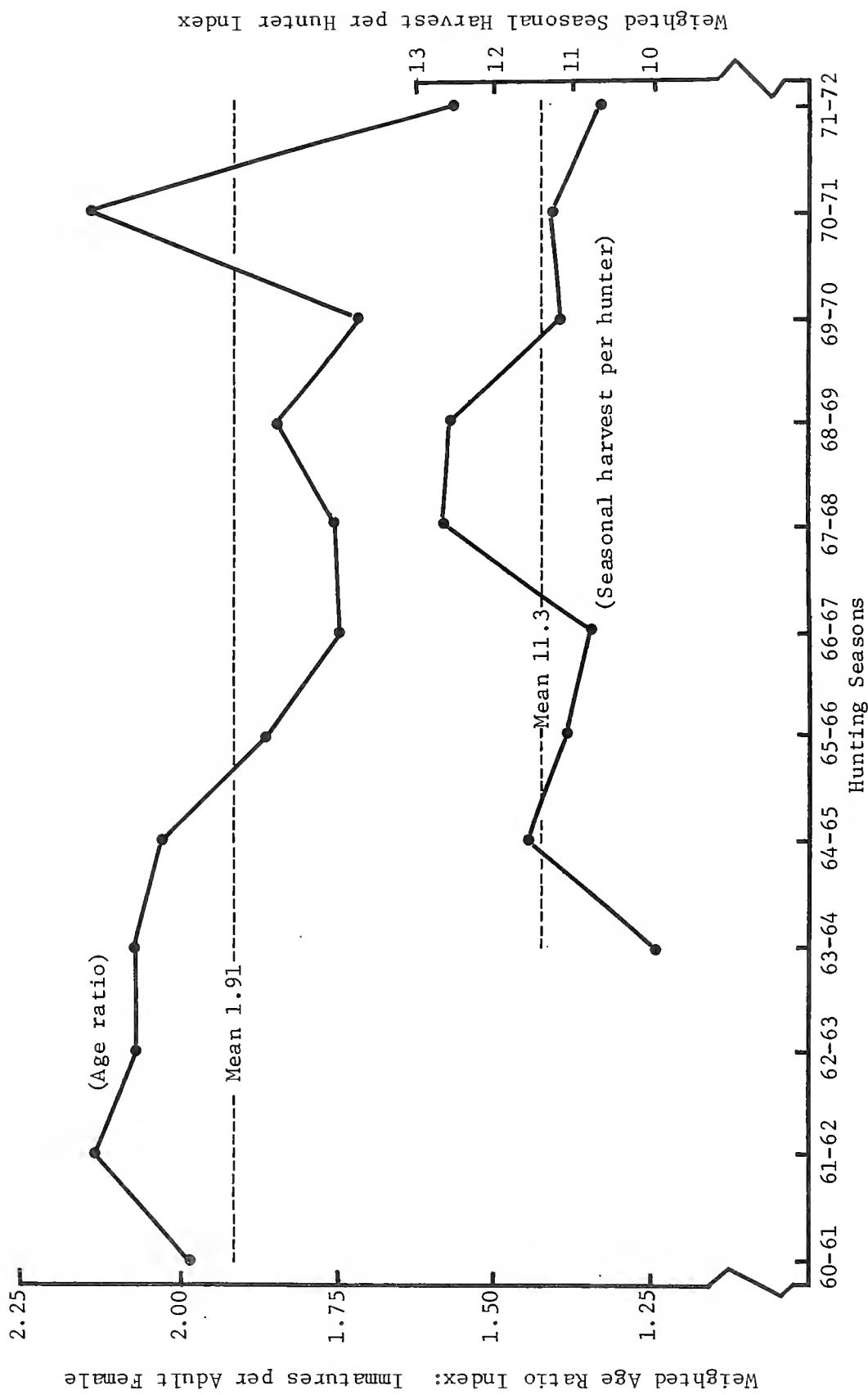


Figure 3.--Weighted age ratio and seasonal harvest per hunter indexes, as determined from annual woodcock wing-collection survey data from comparable hunters (Base year - 1969-70).

Although data from only 2 years surely do not establish positive correlation between spring temperatures and woodcock productivity, they suggest that this and other weather factors merit closer scrutiny.

When age ratios are graphically depicted, using annual percent change with 1969-70 as the base year, the 1970-71 age ratio is highest, while the 1971-72 figure is the lowest.

Variation in the productivity index due to differences in hunters sampled has been eliminated by using only data from comparable hunters (hunters participating in the survey both years) in computing the change in weighted index.

Hunter success index.--Trends in the woodcock daily and seasonal harvest have been appraised by determining annual percent change in the number of wings submitted by hunters who participated in the survey for 2 consecutive years (table 13). Average daily harvests have changed little from year to year. The trend was downward from 1963 to 1966, upward from 1966 to 1968, and down slightly since 1968.

Seasonal harvest has shown slightly greater annual percent changes than daily harvest. The apparent upward trend through 1970-71 (fig. 3) is misleading because the substantial increases in 1964-65 and 1967-68 probably resulted from greater hunting opportunity. Hunting was curtailed by hazardous fire conditions in the Northeast in 1963. The return to normal in 1964 resulted in the much higher seasonal harvest-per-hunter. The increased harvest in 1967-68 may be attributed to an increase in season length from 50 to 65 days. When sharp increases in 1964-65 and 1967-68 are discounted, the trend is almost steadily downward.

The composition of the wing collection by daily bag size was examined for the three past seasons; however, little variation between seasons was evident.

Bag Size	1969-70		1970-71		1971-72	
	Successful Hunts	Percent of Total	Successful Hunts	Percent of Total	Successful Hunts	Percent of Total
1	2,822	39.7	2,088	40.1	3,142	39.5
2	1,533	21.6	1,637	21.2	1,758	22.1
3	1,042	14.7	1,081	14.0	1,181	14.8
4	733	10.3	842	10.9	711	8.9
5	976	13.7	1,060	13.8	1,163	14.6
Total	7,106	100.0	7,708	100.0	7,955	100.0

Greater variations were evident in regional summaries of the data (table 14). However, annual variations were small when samples totaled over 1,000 hunts.

Hunter success, along with other factors, needs further study before hunting pressure can be equated with woodcock population trends. A correlation may be revealed by information obtained through a uniform sampling frame such as the proposed Federal migratory upland game bird hunting permit, and from accumulating banding data.

Regional analysis of wing-collection data

Sex and age ratios.--An investigation of factors affecting productivity and hunter success was initiated in 1970. Since differential migration by sex-age groups in correlation with the timing of hunting seasons would materially influence the productivity index, the first step was an analysis of regional sex and age ratios by time periods.

Recent band recovery data suggest less intermingling of woodcock between the Central and Atlantic Regions than was formerly supposed. Thus, data from the two regions were analyzed separately. Within each region, three subunits were established (fig. 1). The criteria used in selecting these were:

1. Northern subunit--States having relatively high density woodcock breeding populations and harvests with a high proportion of locally reared birds.
2. Middle subunit--States having moderate to low density breeding populations and harvests consisting primarily of migrant woodcock.
3. Southern subunit--States having very low breeding population densities and harvests consisting almost entirely of wintering and migrant woodcock.

Naturally, there is overlapping of characteristics between these subregions, because State boundaries, though best, do not accurately delineate the criteria described.

The woodcock harvest, as represented by the wing collection, was divided into 10-day periods for regional comparisons. These minor periods were grouped into three major periods for each subregion. Grouping dates were selected that placed approximately 50 percent of the wings in the middle period and 25 percent each in the first and

third periods. If seasonal trends in sex or age ratios occur, the broad separation between early and late season should make them more apparent. Data for the 1968-69 through 1971-72 seasons are summarized for the Central Region in table 15, and for the Atlantic Region in table 16. Extension of the season framework through February (February 15 in 1971 and February 28 in 1972) shifted the median harvest period to a later time in southern subregions the 2 latest years.

In view of the effect of weather on timing of migration, and subsequently the availability of woodcock for harvest, conclusive results cannot be expected from only 4 years' data. Inconsistencies will be noted in sex and age ratios in the tables. However, we believe that accumulated data may eventually reveal enlightening trends.

Timing of harvest.--Distribution of the harvest as shown by 10-day wing-collection periods provides some insight into timing of the fall migration. Inasmuch as substantial numbers of woodcock are produced in Canada, the harvest in even the northern States includes some migrants. It is possible, however, to encompass the period of greatest abundance of woodcock for a particular State within a season length of 65 days. In those few States where the most advantageous hunting season for resident game birds is the prime consideration in determining the opening date of the woodcock season, the period of greatest woodcock abundance may be missed in many, if not most, years. A north-to-south distribution of the 1968-69 through 1971-72 harvests is shown for the Central Region (table 17) and Atlantic Region (table 18). Larger samples are needed for some States, but the tables indicate the chronology of fall migration as reflected by the harvest.

No adjustment was made in either table for periods in which the beginning or end of the season occurred, and which encompassed less than 10 days of hunting. Heavier hunting pressure on the opening day or first weekend may partially compensate for a shortened period at the beginning of the season. However, concentration of hunting effort and harvest in the forepart of the season probably is not as great for woodcock as for some game birds.

The wing-collection survey data were summarized by 7-day periods as well as by 10-day periods. Distribution of the harvest by 7-day periods beginning with the opening date in each State provides better information on the timing of harvests in individual States (tables 19 and 20). The shorter period makes regional pooling of data more difficult because it magnifies problems of State-to-State variation in opening dates. However, it eliminates the variation in hunting opportunity associated with 10-day periods where the first period may contain from 1 to 10 days, and some periods may include two weekends. The effect of weekend hunting varies materially, depending upon whether or not Sunday hunting is permitted.

The woodcock hunting season in some northern States may be curtailed by weather conditions or conflicts with the deer hunting season when use of bird dogs may be undesirable. However, hunters in most of those States still enjoy good woodcock harvests.

Data in tables 19 and 20 suggest that some States could benefit from earlier or later seasons than those selected in 1969-70, 1970-71, and 1971-72. Although results may be biased by inadequate sample size, unduly high percentages of the total season's harvest in the first 2 weeks suggest that an earlier season might be desirable. In contrast, the concentration of the harvest towards the end of the season suggests the need for a later season. States having small samples in the survey may profit by examining data from other States in their same general latitude.

Figures 4 and 5 show correlation between the advent of freezing temperatures and progress of migration. Average dates of the first killing frost, a reflection of freeze temperature frequency (fig. 4), show irregular patterns due to the influence of elevation and nearby large bodies of water. The average duration of snow cover, as reflected by mean annual snowfall (fig. 5), shows patterns which relate to timing of harvests shown in tables 15 and 16.

SUMMARY OF RESEARCH ACTIVITIES

Emphasis on woodcock research has now shifted to breeding ground banding and to the exploration of specific problems. Federally funded woodcock projects in progress during the fiscal year ending June 30, 1972, are listed in table 21. Banding is a particularly pressing need, and pilot banding projects have begun in several States and Provinces. Since several newly developed techniques are involved, additional training sessions are needed before a comprehensive banding program can be implemented. Many different organizations at the Federal and State-Provincial level are involved. While this somewhat complicates coordination of plans for training, it will increase the output of banded woodcock for the limited funds and manpower that each organization can allot to this species. Expansion of banding effort in the 11-year period, 1961-71, is reflected in table 22. The increase, particularly evident in preseason banding, is graphically shown in figure 6.

Comparisons of recovery locations of woodcock banded in the Atlantic Region with those banded in the Central Region (table 23 and fig. 7) add to existing evidence that, except for the shearing effect of the Atlantic coastline, principal woodcock migration routes have north-south orientation. Interspersion on the wintering grounds of birds reared in Atlantic and Central Regions is suggested by recoveries of winter-banded birds in the northern parts of both regions. However, 85 percent of the recoveries from winter-banded woodcock were in the region of banding.

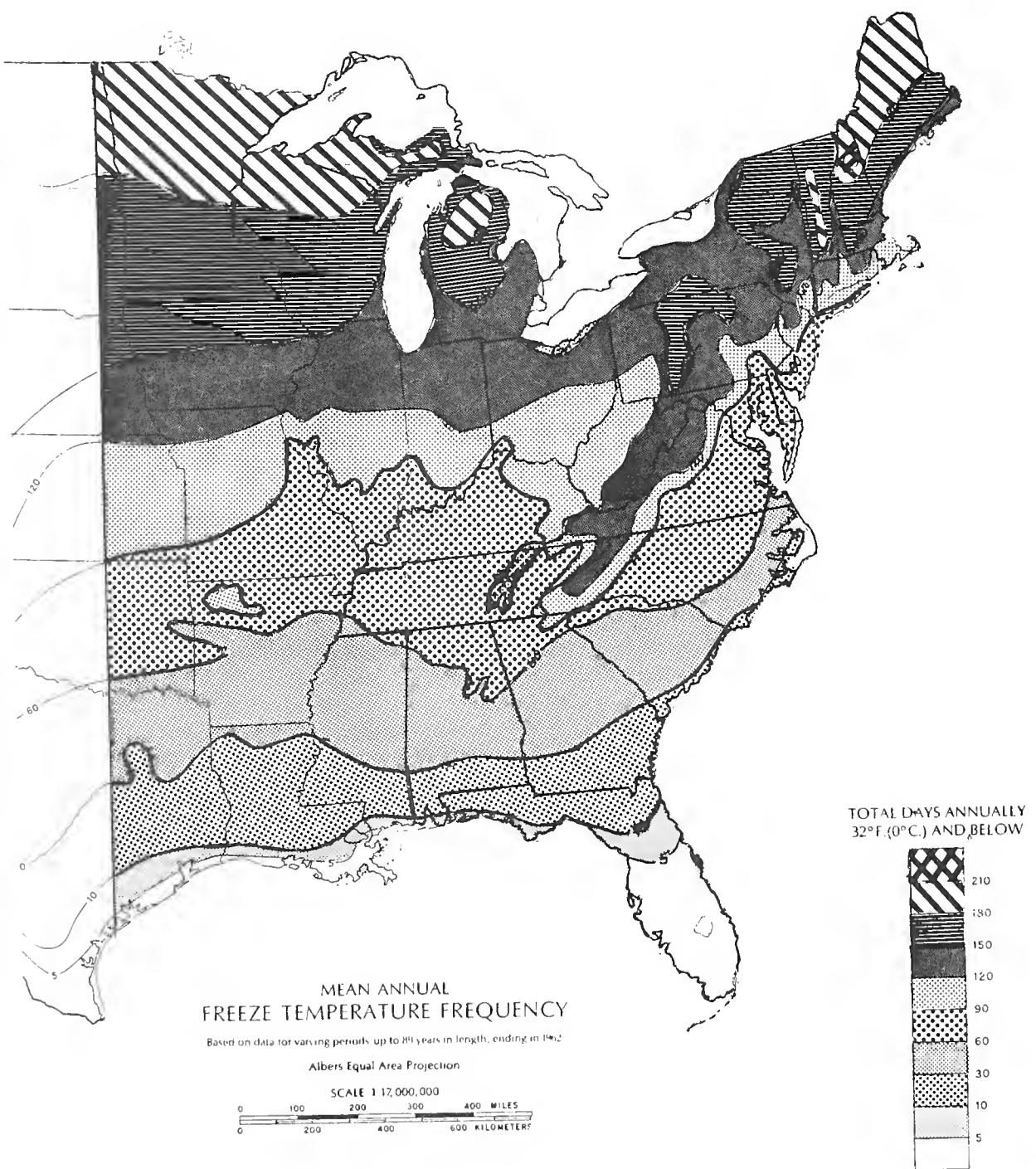


Figure 4.--Mean annual freeze temperature frequency (Anonymous, 1970)



Figure 5.--Mean annual snowfall (Anonymous, 1970)

C - Central Region

A - Atlantic Region

Fall & Winter Banding

Spring & Summer Banding

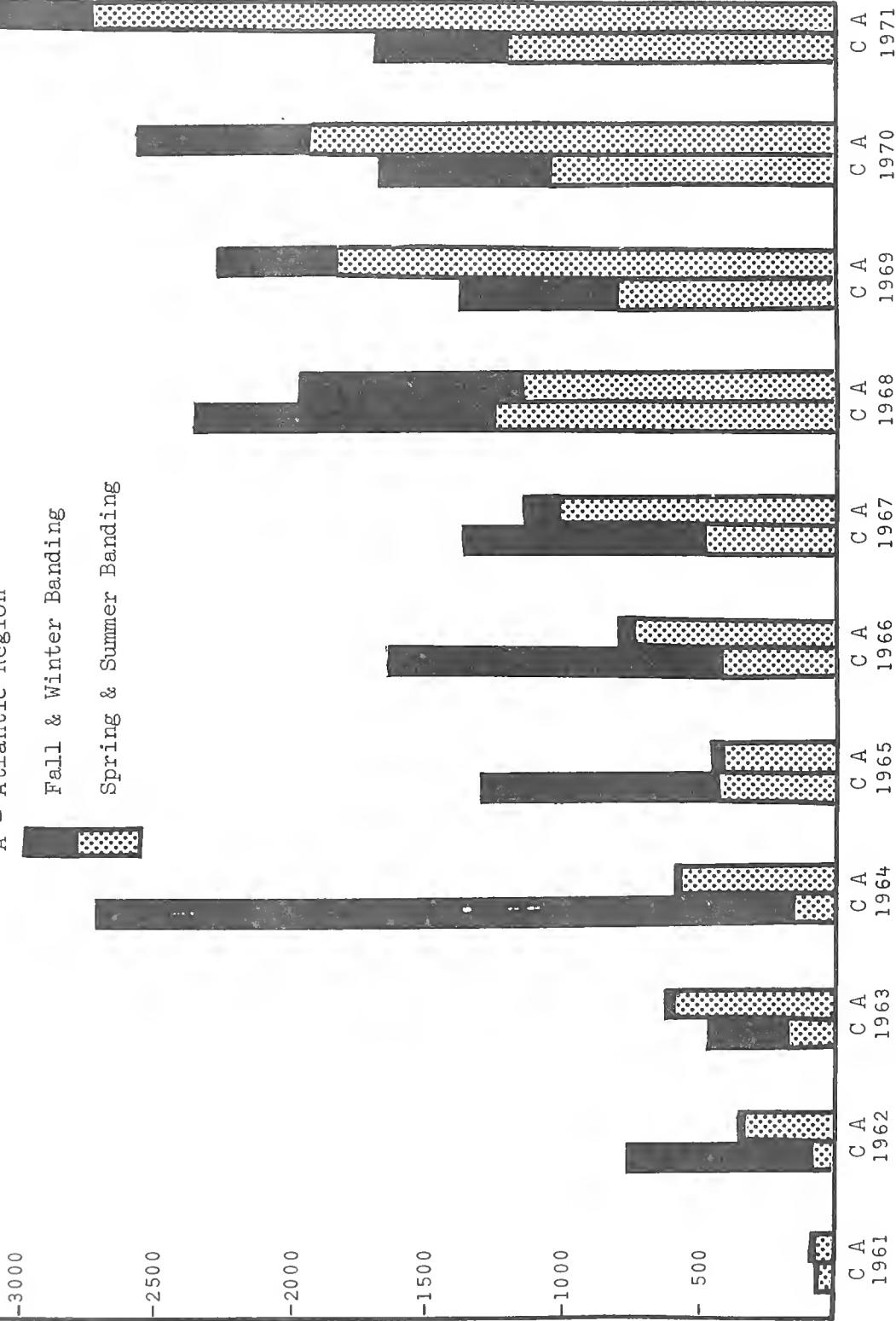


Figure 6.--Woodcock banding by regions, 1961-71 (excluding experimental birds)



Figure 7.--Recoveries of woodcock banded on breeding grounds north of 40th parallel and in West Virginia (excluding birds recovered in degree block of banding or in contiguous degree block but including all years and all "How Obtained" codes)

Few woodcock banded in the northern part of one region have been recovered in the northern part of the other. Except for an indirect recovery in New Hampshire of a woodcock banded in Indiana, and a direct recovery in Pennsylvania of a bird banded in Michigan, lateral movement has been limited to border area banding. These recoveries demonstrate a minor problem in using State and Province boundaries to delineate regions. Lack of interchange between breeding grounds suggests strong fidelity to natal areas and fairly distinct Atlantic and Central breeding populations.

ACKNOWLEDGMENTS

Most data in this report would not be available without the cooperation of the Canadian Wildlife Service; Provincial and State conservation departments; Bureau personnel of Regions 3, 4, and 5; and the many individuals who assisted in the surveys.

Special appreciation is extended to the University of Massachusetts Press for permission to reproduce the late Mr. A. Lassell Ripley's etching "Early Woodcock" which again appears on this report's cover.

Also, special thanks are extended to the biologists who worked an entire week at the Patuxent Wildlife Research Center, processing 19,165 woodcock wings and coding the data for computer analysis. These cooperators, and their affiliations, were:

Louisiana Wildlife & Fisheries Commission
Larry Soileau

Maine Dept. of Inland Fisheries and Game
Gary Donovan

Maryland Fish & Wildlife Administration
Earl H. Hodil
Joshua Sandt
Joe Shugars

Michigan Dept. of Natural Resources
William Fouch

New Jersey Div. of Fish, Game, and Shellfisheries
Lee Widjeskog

Pennsylvania Cooperative Wildlife Research Unit
Paul D. Caldwell
Richard A. Coon

Rhode Island

Alan E. Hutchinson

Virginia Comm. of Game & Inland Fisheries

Hassel Taylor

West Virginia Dept. of Natural Resources

Robert C. Kletzly

Joe Rieffenberger

Wisconsin Dept. of Natural Resources

Larry Gregg

Bureau of Sport Fisheries and Wildlife

William Krohn, Orono, Maine, Field Station

Joseph Ware, Moosehorn National Wildlife Refuge

Preparation of this report has been a team effort, with data analysis in this station's Electronic Data Processing Section, editing by George K. Brakhage, George M. Jonkel, and Henry M. Reeves, and typings by Mrs. Kit Munson.

REFERENCES

Anonymous

1970. The National Atlas of the United States of America.
U.S. Department of the Interior, Geological Survey.
Washington, D.C. 417 pp.

Benson, Denis A.

1968. Waterfowl harvest and hunter activity in Canada during the 1967-68 hunting season. Canadian Wildlife Service, Progress Notes No. 5, June 10, 1968. 39 pp.

1969. Waterfowl harvest and hunter activity in Canada during the 1968-69 hunting season. Canadian Wildlife Service, Progress Notes No. 10, July 1969. 44 pp.

1970. Report on sales of the Canada migratory game bird hunting permit and waterfowl harvest and hunter activity, 1969-70. Canadian Wildlife Service, Progress Notes No. 16, July 1970. 34 pp.

1971. Report on sales of the Canada migratory game bird hunting permit and waterfowl harvest and hunter activity, 1970-71. Canadian Wildlife Service, Progress Notes No. 22, August 1971. 29 pp.

Clark, Eldon R.

1970. Woodcock status report, 1969. Bureau of Sport Fisheries and Wildlife. Special Scientific Report--Wildlife No. 133. 35 pp.

1972. Woodcock status report, 1971. Bureau of Sport Fisheries and Wildlife. Special Scientific Report--Wildlife No. 153. 47 pp.

MacDonald, Duncan, and Elwood Martin

1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bureau of Sport Fisheries and Wildlife. Special Scientific Report--Wildlife No. 142. 29 pp.

Martin, Fant W.

1964. Woodcock sex and age determination from wings. Journal of Wildlife Management, Vol. 28, No. 2, p. 287-293.

U.S. Department of Commerce

1970. Climatological Data.

Wisconsin, May 1970, Vol. 75, No. 5, p. 65-79.

Minnesota, May 1970, Vol. 76, No. 5, p. 65-80.

New York, May 1970, Vol. 82, No. 5, p. 73-90.

New England, May 1970, Vol. 82, No. 5, p. 99-122.

Michigan, May 1970, Vol. 85, No. 5, p. 65-79.

1971. Climatological Data.

Wisconsin, May 1971, Vol. 76, No. 5, p. 65-79.

Minnesota, May 1971, Vol. 77, No. 5, p. 65-79.

New York, May 1971, Vol. 83, No. 5, p. 81-96.

New England, May 1971, Vol. 83, No. 5, p. 101-122.

Michigan, May 1971, Vol. 86, No. 5, p. 65-79.

A P P E N D I X

Table 1.--Woodcock harvest data from Waterfowl Hunter Mail Survey

REFERENCE AREA	Waterfowl hunters in woodcock hunting States		Waterfowl hunters who hunted woodcock		Waterfowl hunters who hunted woodcock		Woodcock harvest by waterfowl hunters	
	Number*	% Increase**	Number*	% Increase**	Number*	% Increase**	Number*	% Increase**
North Central	410,125	34.1	58,750	41.5	156,946	11.6		
Mid-Central	230,030	44.2	15,731	74.5	41,306	47.5		
South Central	362,985	47.4	24,323	89.1	132,678	88.8		
REGION TOTAL	1,003,140	41.0	98,804	55.8	330,882	38.5		
North Atlantic	179,655	71.8	55,758	82.5	191,498	59.2		
Mid-Atlantic	179,315	56.8	35,315	117.9	103,585	125.5		
South Atlantic	101,655	44.6	8,398	88.7	28,058	54.2		
REGION TOTAL	460,625	59.3	99,471	94.2	323,141	75.2		
Northern Zone	589,780	43.7	114,507	58.9	348,444	33.6		
Mid-Zone	409,345	49.5	51,046	102.4	144,892	95.9		
Southern Zone	464,640	46.7	32,722	89.0	160,687	81.7		
U.S. TOTAL IN WOODCOCK RANGE	1,463,765	46.3	198,274	73.0	654,022	54.5		

*Average of two latest seasons for which data are available (1969-70 and 1970-71).

**From average of 1964-65 and 1965-66 seasons to average of 1969-70 and 1970-71 seasons (5-year period).

Table 2.--Comparison of woodcock harvest reported by waterfowl hunters with that reported by State game harvest surveys in Michigan and New York

Year	Michigan			New York		
	Woodcock Reported in Waterfowl Mail Survey	Woodcock Reported in State Harvest Survey	Percent of State Harvest Reported in Waterfowl Mail Survey	Woodcock Reported in Waterfowl Mail Survey	Woodcock Reported in State Harvest Survey	Percent of State Harvest Reported in Waterfowl Mail Survey
1964	94,554	176,470	53.6	39,672	110,623	35.9
1965	63,025	152,310	41.4	44,365	107,090	41.4
1966	68,813	180,750	38.1	49,468	118,764	41.7
1967	73,866	180,480	40.9	77,397	134,566	57.5
1968	43,125	160,840	26.8	78,166	138,252	56.5
1969	56,678	141,950	39.9	86,501	158,397	54.6

Table 3.--Woodcock breeding population indexes as indicated by singing-ground surveys in 1971 and 1972 (random routes only)

State or Province	Number of routes conducted		Comparable routes*	Woodcock heard per comparable route	
	1971	1972		1971	1972
<u>ATLANTIC REGION</u>					
Connecticut	10	9	11	2.27	2.36
Delaware	3	2	2	0.00	0.00
Maine	58	53	45	4.38	4.49
Maryland	18	11	13	1.54	1.31
Massachusetts	15	17	12	3.08	2.17
New Brunswick	57	56	29	5.14	6.00
New Hampshire	15	15	13	3.62	5.15
New Jersey	14	13	14	2.29	1.57
New York	70	71	77	3.01	2.77
North Carolina	21	14	53	.06	.06
Nova Scotia	53	43	38	2.45	2.03
Pennsylvania	54	43	60	1.25	1.28
Prince Edward Island	11	9	9	4.89	2.89
Quebec	10	20	6	3.33	4.50
Rhode Island	3	2	4	2.25	1.25
Vermont	20	21	18	2.89	3.83
Virginia	47	41	58	.62	.48
West Virginia	23	21	48	.62	.92
REGIONAL TOTAL & WEIGHTED AVG.**	502	461	510	2.46	2.50
REGIONAL INDEX CHANGE					+1.59%
<u>CENTRAL REGION</u>					
Illinois	23	20	19	.58	.32
Indiana	39	25	54	.26	.56
Michigan	122	117	97	3.86	3.62
Minnesota	48	47	54	1.74	1.65
Ohio	81	57	72	1.47	1.57
Ontario	66	65	45	6.07	6.93
Wisconsin	78	68	90	2.11	2.02
REGIONAL TOTAL & WEIGHTED AVG.**	457	399	431	3.18	3.29
REGIONAL INDEX CHANGE					+3.67%
RANGEWIDE TOTAL & WEIGHTED AVG.**	959	860	941	2.81	2.89
RANGEWIDE INDEX CHANGE					+2.73%

*Includes routes carried as constant zero routes.

**Weighted averages are sums of products of woodcock heard per comparable route and the corresponding State or Province percentage of the total land area sampled. States or Provinces excluded where one comparable route represents more than 2,000 square miles or where fewer than 0.5 birds are heard per route.

Table 4.--Computation of woodcock singing-ground survey weighting factors

Survey Area*	Land Area** (Sq. Mi.)	Comparable Routes	Sq.Mi. per Comp. Rt.	Weighting Factor Regional	Weighting Factor Rangewide
<u>ATLANTIC REGION</u>					
Connecticut	4,870	11	443	.0169	.0088
Maine	30,933	45	687	.1075	.0558
Maryland	9,891	13	761	.0344	.0178
Massachusetts	7,833	12	653	.0272	.0141
New Brunswick	27,835	29	960	.0968	.0502
New Hampshire	9,033	13	695	.0314	.0163
New Jersey	7,532	14	538	.0262	.0136
New York	47,869	77	622	.1664	.0863
Nova Scotia	20,402	38	537	.0709	.0368
Pennsylvania	45,025	60	750	.1565	.0812
Prince Edward Island	2,184	9	243	.0076	.0039
Rhode Island	1,049	4	262	.0036	.0019
Vermont	9,274	18	515	.0322	.0167
Virginia	39,841	58	687	.1385	.0719
West Virginia	24,084	48	502	.0837	.0434
REGIONAL TOTAL	287,655	455	632	1.0000	
<u>CENTRAL REGION</u>					
Michigan	56,818	97	586	.2129	.1025
Minnesota***	55,655	54	1,031	.2086	.1004
Ohio	41,018	72	570	.1537	.0740
Ontario***	58,859	45	1,308	.2206	.1062
Wisconsin	54,464	90	605	.2041	.0982
REGIONAL TOTAL	266,814	358	745	1.0000	
RANGEWIDE TOTAL	554,469	813	682		1.0000

*Excluding States and Provinces where each comparable route represents more than 2,000 square miles or where fewer than 0.5 birds are heard per route.

**Land area only (inland water excluded) as listed in 1970 Commercial Atlas and Marketing Guide - Rand-McNally & Co.

***Excluding sections of Minnesota and Ontario outside of survey area.

Table 5.--Distribution of contacts and response rate in 1971-72 woodcock wing-collection survey (including Code 4 contacts added during season)

State of residence	Packets mailed by contact code*						Total hunters contacted	Total wings received**	Wings per contact
	1	2	4	7	8	9			
Ala.	8	96	--	--	6	36	3	143	.32
Ark.	5	15	1	--	--	--	--	21	.90
Conn.	129	176	8	--	--	--	--	313	2.11
Del.	10	73	3	--	--	--	1	85	.73
D.C.	--	2	--	--	--	--	--	2	.00
Fla.	2	85	2	1	1	17	1	107	.19
Ga.	21	80	17	--	18	108	9	235	.63
Ill.	12	89	1	--	--	--	2	104	1.09
Ind.	23	89	5	--	--	--	1	116	1.28
Iowa	1	15	1	--	--	--	--	17	1.06
Kans.	--	72	--	--	--	--	2	70	.00
Ky.	4	27	--	--	--	--	--	31	.00
La.	34	312	7	--	--	--	4	349	.86
Maine	163	85	12	7	89	490	10	836	3.82
Md.	30	174	5	1	9	177	5	391	.71
Mass.	140	249	9	--	--	--	--	398	3.67
Mich.	153	245	24	1	49	505	12	965	2.184
Minn.	32	159	9	--	--	61	2	259	2.75
Miss.	10	83	3	--	--	198	16	278	.09
Mo.	8	62	3	--	1	3	--	77	.43
N.H.	55	174	10	1	--	8	2	246	1.72
N.J.	177	169	23	--	43	--	4	408	5.45
N.Y.	161	100	19	--	--	477	12	745	2.24
N.C.	18	97	8	--	12	16	2	149	1.20
Ohio	75	241	3	--	--	2	4	317	1.87
Okla.	2	30	--	--	--	5	--	37	.19
Pa.	151	288	22	--	--	--	3	458	2.39
R.I.	19	49	3	7	--	124	3	199	1.61
S.C.	16	78	4	1	--	23	2	120	1.08
Tenn.	16	22	--	--	--	23	--	61	.46
Tex.	8	46	3	--	--	16	2	71	.85
Vt.	39	60	2	2	--	49	1	151	5.76
Va.	23	78	4	--	5	84	3	191	.52
W. Va.	19	40	2	--	7	142	4	206	1.23
Wis.	151	225	29	--	36	--	4	437	3.44
TOTAL	1,715	3,885	242	21	276	2,567	113	8,593	2.20

* Code 1 - Previous year's Code 1, 2, 4, 7, and 8 hunters who submitted wings.

Code 2 - Waterfowl mail survey hunters who reported hunting woodcock.

Code 4 - Requested participation or proposed by fellow hunter.

Code 7 - Appeared on both Code 1 and Code 9 lists.

Code 8 - Previous year's Code 9 hunters who submitted wings.

Code 9 - From list provided by State, primarily from State kill survey.

** Excluding wings with incomplete identification data or from Special Study areas.

Table 6.--Changes in regional distribution of hunter contacts, 1968-69 to 1971-72

REFERENCE AREA	1968-69	1969-70	1970-71	1971-72	4-Year Percent Change
North Central	1,894	1,850	1,757	1,661	-12.3
Mid-Central	542	791	721	793	+46.3
South Central	286	254	454	899	+214.3
REGION TOTAL	2,722	2,895	2,932	3,353	+23.2
<hr/>					
North Atlantic	2,836	3,105	2,304	2,888	+1.8
Mid-Atlantic	1,424	1,470	1,764	1,741	+22.3
South Atlantic	264	330	447	611	+131.4
REGION TOTAL	4,524	4,905	4,515	5,240	+15.8
<hr/>					
Northern Zone	4,730	4,955	4,061	4,549	-3.8
Mid-Zone	1,966	2,261	2,485	2,534	+28.9
Southern Zone	550	584	901	1,510	+174.5
<hr/>					
U.S. TOTAL	7,246	7,800	7,447	8,593	+18.6

Table 7.—Data from woodcock wing-collection surveys conducted during the 1969-70, 1970-71, and 1971-72 hunting seasons

State of residence	Number of cooperators			Number of envelopes			Number of wings			Avg. no. of wings per envelope			Avg. no. of wings per cooperator			
	69-70		70-71	71-72	69-70		70-71	71-72	69-70		70-71	71-72	69-70		70-71	71-72
	69-70	70-71	71-72	69-70	70-71	71-72	69-70	70-71	71-72	69-70	70-71	71-72	69-70	70-71	71-72	
Ala.	8	14	14	24	33	37	36	59	46	1.5	1.8	1.2	5	4	3	
Ark.	5	6	4	29	31	43	54	19	1.5	1.7	1.7	9	9	5	5	
Conn.	137	127	101	476	439	321	1,062	930	660	2.2	2.1	2.1	8	7	7	
Del.	8	10	12	15	28	29	17	40	62	1.1	1.4	2.1	2	4	5	
Fla.	7	3	8	18	13	19	26	20	1.4	2.0	1.1	4	9	3	3	
Ga.	17	38	46	27	64	83	42	104	147	1.6	1.8	2	3	3	3	
Ill.	7	12	18	35	30	51	69	53	113	2.0	1.8	2.2	10	4	6	
Ind.	21	22	23	76	63	75	178	111	148	2.3	1.8	2.0	8	5	6	
Iowa	--	--	1	--	--	9	--	--	18	--	--	2.0	--	--	18	
Ky.	5	4	--	7	4	--	7	5	--	1.0	1.2	--	1	1	--	
La.	47	34	36	223	128	136	678	302	299	3.0	2.4	2.2	14	9	8	
Maine	247	262	236	1,117	1,257	1,200	2,957	3,356	3,194	2.6	2.7	2.7	12	13	14	
Md.	28	40	47	71	108	126	169	215	278	2.4	2.0	2.2	6	5	6	
Mass.	166	139	129	733	611	579	1,813	1,488	1,462	2.5	2.4	2.5	11	11	11	
Mich.	199	203	222	641	827	932	1,524	2,058	2,184	2.4	2.5	2.3	8	10	10	
Minn.	31	30	71	114	98	288	330	264	712	2.9	2.7	2.5	11	9	10	
Miss.	6	10	11	18	25	20	36	42	25	2.0	1.7	1.3	6	4	2	
Mo.	7	9	11	19	16	15	42	33	1.4	2.2	2.1	2	5	4	4	
N.H.	68	55	55	271	265	190	598	598	424	2.2	2.3	2.2	9	11	8	
N.J.	245	222	180	1,062	904	856	2,561	2,052	2,223	2.4	2.3	2.3	10	9	12	
N.Y.	244	160	160	853	728	696	6,006	1,743	1,668	2.4	2.4	2.4	8	11	10	
N.C.	17	30	28	34	90	103	62	211	179	1.8	2.3	1.7	4	7	6	
Ohio	60	75	79	202	247	257	510	654	592	2.5	2.6	2.3	9	9	7	
Okla.	--	2	4	--	3	6	--	3	7	--	1.0	1.2	--	2	2	
Pa.	144	150	151	434	467	476	977	1,068	1,093	2.3	2.3	2.3	7	7	7	
R.I.	26	26	39	100	97	131	238	239	320	2.4	2.5	2.4	9	9	8	
S.C.	15	17	23	32	43	73	64	77	129	2.0	1.8	4	5	6	6	
Tenn.	29	14	8	34	18	17	53	22	28	1.6	1.2	1.6	2	2	4	
Tex.	4	7	13	23	14	25	95	16	60	4.1	1.1	2.4	24	2	5	
Vt.	41	41	56	171	225	330	323	552	870	1.9	2.5	2.6	8	13	16	
Va.	16	28	31	48	81	61	105	163	99	2.2	2.0	1.6	7	6	3	
W. Va.	13	26	25	52	83	100	1,36	184	254	2.6	2.2	2.5	10	7	10	
Wis.	169	180	160	495	614	651	1,003	1,411	1,505	2.0	2.3	2.3	6	8	9	
Other	--	--	--	--	--	--	230	243	294	--	--	--	--	--	--	
TOTAL	2,020	1,996	2,000	7,436	7,657	7,904	17,963	18,385	19,165	2.4*	2.4*	2.4*	8.8*	9.2*	9.4*	

*Unweighted mean (includes data from all States, but excludes information from the special study areas and unknown contact codes).

Table 8.—Comparison of hunters and rate of wings received for principal code categories, 1971-72 season

*One respondent contributed wing of other species.

Table 9.--Comparison of early season hunting and harvest age ratios by principal code categories in two States, 1968-69 to 1971-72

	Maine			Michigan				
	1968-69	1969-70	1970-71	1971-72	1968-69	1969-70	1970-71	1971-72
First Week of Season Wings								
Code 1*								
Number	199	173	360	372	220	227	237	267
Percent of Season Total	12.2	10.7	17.9	19.0	20.1	19.8	17.1	17.1
Code 2*								
Number	66	35	23	38	37	50	63	16
Percent of Season Total	20.4	18.1	18.4	30.2	21.9	40.0	30.9	14.4
Code 9*								
Number	122	111	194	109	58	33	42	30
Percent of Season Total	18.1	13.0	23.4	16.3	29.4	19.4	17.3	14.1
State Total**								
Number	396	355	631	603	315	321	364	343
Percent of Season Total	15.1	12.8	19.2	19.7	21.6	21.7	19.3	16.7
Immatures/Adult Female Ratio								
Code 1*								
Immatures	910	715	1,072	968	552	492	853	701
Immatures/Ad. Female	2.26	1.54	2.09	1.72	1.59	1.21	2.39	1.28
Code 2*								
Immatures	160	90	77	70	87	51	84	42
Immatures/Ad. Female	1.93	1.73	2.96	2.19	1.74	1.19	1.56	0.93
Code 9*								
Immatures	383	421	419	340	86	74	135	103
Immatures/Ad. Female	1.95	1.70	1.96	1.63	1.23	1.35	1.71	1.36
State Total**								
Immatures	1,383	1,294	1,751	1,525	725	631	1,094	939
Immatures/Ad. Female	2.12	1.64	2.10	1.72	1.55	1.22	2.17	1.30

*Code 1 - Submitted wings the previous year (excluding Code 9 hunters of previous year).

Code 2 - Hunters on waterfowl mail survey who reported hunting woodcock.

Code 9 - From list provided by State from its kill survey.

(Note: Code 7 figures are included with both Code 1 and Code 9 results).

**Excluding Code 4.

Table 10.--Derivation of weighting factors for the 1971-72 woodcock wing-collection survey

STATE*	1969-70	1970-71	1969-70	1970-71	Woodcock Kill by				License Holders to Stamp Purchasers	Stamp Sales Ratio	Percent of Mean	State Kill Index	State Weight Factor	
					Hunting License Holders	Duck Stamp Sales	Duck Stamp Purchasers	1969-70	1970-71	1969-70	1970-71	Mean		
Conn.	77,488	85,452	12,889	15,779	19,531	24,312	6,0119	5,4156	5,7137	64.792	14,203	.0313		
La.	337,641	348,635	105,274	129,046	111,991	99,385	3,2072	2,7016	2,9544	33.502	35,408	.0781		
Maine	202,766	219,373	15,939	18,182	26,786	34,420	12,7214	12,0654	12.3934	140.539	43,009	.0948		
Mass.	118,518	123,589	25,630	29,993	33,489	33,410	4,6242	4,1206	4,3724	49.582	16,585	.0366		
Mich.	941,025	941,426	101,562	131,404	56,678	80,595	9,2655	7,1644	8,2149	93.156	63,939	.1410		
Minn.	356,607	377,384	144,562	173,877	13,840	21,501	2,4667	2,1704	2,3186	26.292	4,646	.0102		
N.H.	98,887	97,360	8,938	9,880	13,599	9,876	11,0637	9,8543	10,4590	118.603	13,921	.0307		
N.J.	184,527	196,533	32,974	35,002	29,812	29,086	5,5965	5,6149	5,6057	63.568	18,720	.0413		
N.Y.	758,512	756,060	98,403	108,582	86,501	77,693	7,7082	6,9630	7.3356	83.184	68,292	.1506		
Ohio	540,718	565,896	35,841	43,508	20,300	13,631	15,0866	13,0067	14,0467	159.287	27,024	.0596		
Pa.	1,134,316	1,166,634	67,224	81,074	44,641	56,816	16,8737	14,3897	15.6317	177.261	89,922	.1982		
Vt.	138,378	148,282	6,317	7,435	5,393	11,885	21.9056	19.9438	20.9247	237.283	20,499	.0452		
Wis.	629,445	634,992	122,291	151,524	47,092	94,187	5,1471	4,1907	4,6689	52.944	37,399	.0824		

*Thirteen States having substantial woodcock harvests and being adequately represented in wing-collection survey.

$$\frac{A}{C} = G \quad \frac{B}{D} = H \quad \frac{G+H}{2} = J \quad \frac{J}{\sum J} = K \quad \frac{L}{\sum L} = M$$

$$\frac{L}{\sum L} = M$$

Table 11.--Woodcock productivity by harvest area as indicated by the 1971-72 wing-collection survey

State or Province of harvest	ADULT			Age and Sex Categories			IMMATURE			Unknown age			Total wings received*	45	Immature per adult female**
							Male	Female	Unknown	Male	Female	Unknown			
	Male	Female	Unknown	12	9	1	2	—	—	21	597	3.93			
Ala.	14	7	—	—	4	—	—	—	—	—	—	—	—	—	—
Ark.	11	3	—	—	215	176	6	1	1	3	56	56	—	—	—
Conn.	97	101	1	—	21	22	1	3	—	—	18	29	—	—	—
Del.	6	3	—	—	8	3	—	—	3	—	145	145	1.13	—	—
Fla.	1	6	—	—	26	27	—	—	3	—	—	29	—	—	—
Ga.	42	47	—	—	11	7	—	—	—	—	—	55	55	—	—
Ill.	6	5	—	—	12	16	1	—	—	—	—	—	—	—	—
Ind.	12	14	—	—	72	79	—	—	—	—	—	310	310	1.57	—
La.	52	96	—	—	965	881	21	11	11	3,787	3,787	1.66	—	—	—
Maine	764	1,127	18	—	69	53	2	5	5	211	211	2.88	—	—	—
Md.	39	43	—	—	196	165	3	4	4	719	719	1.90	—	—	—
Mass.	153	192	6	—	567	529	3	12	12	2,416	2,416	1.28	—	—	—
Mich.	446	856	3	—	147	176	3	21	21	714	714	1.46	—	—	—
Minn.	137	224	6	—	10	12	—	—	—	—	—	39	39	—	—
Miss.	2	14	—	—	1	2	—	—	—	—	—	1.2	1.2	—	—
Mo.	4	5	—	—	43	42	—	—	—	—	—	158	158	2.58	—
N.B.	32	33	5	—	178	202	3	12	12	876	876	1.26	—	—	—
N.H.	171	304	6	—	520	693	3	1	1	1,819	1,819	3.26	—	—	—
N.J.	221	373	8	—	387	478	2	3	3	1,959	1,959	1.26	—	—	—
N.Y.	402	686	1	—	28	23	—	—	—	—	—	153	153	.93	—
N.C.	44	55	—	—	97	109	6	8	8	432	432	1.96	—	—	—
Ohio	95	108	9	—	3	2	—	—	—	—	—	7	7	—	—
Okla.	1	1	—	—	3	2	—	—	—	—	—	—	—	—	—
Ont.	1	2	—	—	272	259	5	12	12	1,158	1,158	1.46	—	—	—
Pa.	236	368	6	—	22	28	1	—	—	—	—	81	81	—	—
R.I.	20	10	—	—	26	24	1	1	1	132	132	1.09	—	—	—
S.C.	32	47	1	—	18	10	—	—	—	52	52	—	—	—	—
Tenn.	10	14	—	—	8	13	—	4	4	61	61	—	—	—	—
Texas	18	18	—	—	215	228	3	6	6	938	938	1.56	—	—	—
Vt.	197	285	4	—	28	31	—	—	—	91	91	—	—	—	—
Va.	13	17	—	—	56	59	—	—	—	244	244	1.62	—	—	—
W. Va.	52	71	1	—	396	440	3	18	18	1,683	1,683	1.55	—	—	—
Wis.	276	543	7	—	—	—	—	—	—	19,027	19,027	1.67	—	—	—
TOTAL	3,607	5,678	82	4,636	4,803	68	153	153	153	19,027	19,027	1.67			

*Excluding wings from special study areas and unknown harvest areas.

**Unweighted data from harvest areas represented by at least 100 wings.

Table 12.--Indexes of woodcock productivity as indicated by age ratios determined from wings received from cooperators who participated in both 1970-71 and 1971-72 wing-collection surveys

State	Proportion of "total" kill (Weighting factor)	Number of wings received			Adult Females		Immature		Immature per adult female*		
		1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	1970-71	1971-72
Ala.		1	3	1	1	1	1	1	1	1	1
Ark.		52	21	20	3	13	7	1	1	1	1
Conn.**	.0313	658	546	107	90	440	366	4.11	4.07	4.11	4.07
Del.		22	51	3	3	13	41	1.11	1.07	1.11	1.07
Fla.		21	3	4	8	14	3	1.11	1.07	1.11	1.07
Ga.		26	31	8	5	12	10	1.11	1.07	1.11	1.07
Ill.		2	19	1	5	9	9	1.11	1.07	1.11	1.07
Ind.		48	42	11	10	29	25	1.11	1.07	1.11	1.07
La.**	.0781	216	177	47	62	130	86	2.77	2.77	2.77	2.77
Maine**	.0948	2,908	2,767	737	810	1,592	1,355	2.16	2.16	2.16	2.16
Md.		121	99	34	23	74	55	2.18	2.18	2.18	2.18
Mass.**	.0366	565	520	150	147	316	251	2.11	2.11	2.11	2.11
Mich.**	.1410	1,882	1,987	508	699	1,096	909	2.16	2.16	2.16	2.16
Minn.**	.0102	192	236	63	76	83	100	1.32	1.32	1.32	1.32
Miss.		15	15	3	4	10	10	1.11	1.07	1.11	1.07
Mo.		11	1	1	1	9	9	1.11	1.07	1.11	1.07
N.H.**	.0307	915	693	264	233	465	308	1.76	1.76	1.76	1.76
N.J.**	.0413	1,349	1,597	309	338	789	1,056	2.55	2.55	2.55	2.55
N.Y.**	.1506	1,669	1,492	392	550	1,081	636	2.76	2.76	2.76	2.76
N.C.		106	99	30	36	53	30	1.77	1.77	1.77	1.77
Ohio**	.0596	331	337	104	80	168	170	1.62	1.62	1.62	1.62
Okla.		3	4	2	1	2	2	1.60	1.60	1.60	1.60
Pa.**	.1982	944	857	287	279	458	382	1.37	1.37	1.37	1.37
R. I.		49	44	7	4	33	28	1.11	1.11	1.11	1.11
S.C.		49	54	12	18	26	20	1.11	1.11	1.11	1.11
Tenn.		11	18	3	3	5	10	1.11	1.11	1.11	1.11
Texas		6	10	2	2	3	5	1.11	1.11	1.11	1.11
Vt.**	.0452	548	454	151	139	257	211	1.70	1.70	1.70	1.70
Va.		135	50	9	11	111	32	12.33	12.33	12.33	12.33
W. Va.		105	138	34	41	50	70	1.47	1.47	1.47	1.47
Wis.**	.0824	1,192	1,290	328	434	586	631	1.79	1.79	1.79	1.79
TOTAL AND WEIGHTED AGE RATIO**	14,152	13,655	3,632	4,110	7,916	6,819	2.16	2.16	2.16	2.16	2.16
CHANGE IN WEIGHTED AGE RATIO											-26.85%

*Computed only for harvest areas (States) represented by at least 150 wings in the 2 years.

**Weighted age ratios are the sum of the products of State age ratios multiplied by their specific weighting factors.

Table 13.--Indexes of woodcock hunting success as indicated by the number of wings received from cooperators who participated in both 1970-71 and 1971-72 wing-collection surveys

State of residence	Weighting factor	Number who cooperated both years	Number of envelopes	Number of wings			Average number of wings per envelope ^x			Average number of wings per cooperator ^x		
				1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	1970-71
Ala.		1	1	2	1	1	3	1.0	1.5	--	--	--
Ark.		4	24	11	46	19	1.9	1.7	2.2	9.4	7.8	--
Conn.**	.0313	68	280	245	639	530	2.3	2.2	2.7	--	--	--
Del.		5	14	18	21	49	1.5	2.7	--	--	--	--
Fla.		1	10	3	21	3	2.1	1.0	1.2	2.6	3.1	--
Ga.		10	21	26	26	31	1.2	1.0	2.3	--	--	--
Ill.		1	2	8	2	18	1.0	2.3	--	--	--	--
Ind.		9	31	27	48	40	1.5	1.5	1.5	--	--	--
Ia.**	.0781	19	77	76	177	167	2.3	2.2	2.2	9.3	8.8	--
Maine**	.0948	146	891	852	2,505	2,292	2.8	2.7	17.2	15.7	--	--
Md.		13	53	46	121	99	2.3	2.2	2.2	9.3	7.6	--
Mass.**	.0366	62	259	234	536	497	2.1	2.1	2.1	8.6	8.0	--
Mich.**	.1410	128	642	689	1,645	1,740	2.6	2.5	2.5	12.9	13.6	--
Minn.**	.0102	17	61	81	158	189	2.6	2.3	2.3	9.3	11.1	--
Miss.		3	10	6	14	8	1.4	1.3	1.3	--	--	--
Mo.		1	3	1	11	1	3.7	1.0	1.0	--	--	--
N.H.**	.0307	25	159	110	354	230	2.2	2.1	2.1	14.2	9.2	--
N.J.**	.0413	129	571	592	1,304	1,562	2.3	2.6	2.6	10.1	12.1	--
N.Y.**	.1506	99	549	500	1,326	1,187	2.4	2.4	2.4	13.4	12.0	--
N.C.		13	41	59	106	99	2.6	1.7	1.7	8.2	7.6	--
Ohio**	.0596	42	128	148	327	335	2.6	2.3	2.3	7.8	8.0	--
Okla.		2	3	4	3	4	1.0	1.0	1.0	--	--	--
Pa.**	.1982	94	347	319	846	760	2.4	2.4	2.4	9.0	8.1	--
R. I.		9	24	22	49	44	2.0	2.0	2.0	--	--	--
S. C.		5	22	29	39	49	1.8	1.7	1.7	--	--	--
Tenn.		6	10	11	11	18	1.1	1.6	1.6	--	--	--
Tex.		2	6	4	6	10	1.0	2.5	2.5	--	--	--
Vt.**	.0452	28	182	163	472	410	2.6	2.5	2.5	16.9	14.6	--
Va.		12	50	32	119	49	2.4	1.5	1.5	9.9	4.1	--
W. Va.		12	47	46	97	123	2.1	2.7	2.7	8.1	10.3	--
Wis.**	.0824	103	454	491	1,089	1,150	2.4	2.3	2.3	10.6	11.2	--
TOTAL AND WEIGHTED												
AVERAGE**		1,069	4,972	4,855	12,119	11,716	2.5	2.4	2.4	11.6	11.0	--

*Computed only for States represented by at least 10 hunters who cooperated both years.

**Weighted average is the sum of the products of State averages multiplied by their specific weighting factors using only States represented by at least 15 hunters who cooperated both years.

Table 14.--Distribution of daily bag sizes in woodcock wing collection by harvest areas

Harvest Area	Year	Bag Size						Total			
		1		2		3		4		5	
		No.	%	No.	%	No.	%	No.	%	No.	%
No. Central	1969-70	529	41.3	260	20.3	191	14.9	126	9.8	174	13.6
	1970-71	643	38.9	328	19.9	240	14.5	193	11.7	248	15.0
	1971-72	803	39.8	419	20.8	317	15.7	169	8.4	309	15.3
Mid-Central	1969-70	121	44.0	68	24.7	37	13.5	25	9.1	24	8.7
	1970-71	129	48.5	51	19.2	34	12.8	18	6.8	34	12.8
	1971-72	170	54.8	68	21.9	39	12.6	8	2.6	25	8.1
So. Central	1969-70	101	33.1	52	17.0	38	12.5	38	12.5	76	24.9
	1970-71	117	49.2	40	16.8	36	15.1	19	8.0	26	10.9
	1971-72	133	53.8	51	20.6	29	11.7	9	3.6	25	10.1
Central Total	1969-70	751	40.4	380	20.4	266	14.3	189	10.2	274	14.7
	1970-71	889	41.2	419	19.4	310	14.4	230	10.7	308	14.3
	1971-72	1,106	43.0	538	20.9	385	15.0	186	7.2	359	13.9
No. Atlantic	1969-70	1,370	37.7	822	22.6	551	15.2	395	10.9	492	13.6
	1970-71	1,366	36.0	828	21.8	584	15.4	467	12.3	548	14.4
	1971-72	1,280	35.3	840	23.2	576	15.9	371	10.2	557	15.4
Mid-Atlantic	1969-70	627	41.9	304	20.3	219	14.6	140	9.4	205	13.7
	1970-71	706	45.9	355	23.1	167	10.9	128	8.3	181	11.8
	1971-72	588	39.6	322	21.7	192	12.9	144	9.7	239	16.1
So. Atlantic	1969-70	74	61.2	27	22.3	6	5.0	9	7.4	5	4.1
	1970-71	127	57.2	35	15.8	20	9.0	17	7.7	23	10.4
	1971-72	168	61.8	58	21.3	28	10.3	10	3.7	8	2.9
Atlantic Total	1969-70	2,071	39.5	1,153	22.0	776	14.8	544	10.4	702	13.4
	1970-71	2,199	39.6	1,218	21.9	771	13.9	612	11.0	752	13.5
	1971-72	2,036	37.8	1,220	22.7	796	14.8	525	9.8	804	14.9
U.S. Total	1969-70	2,822	39.7	1,533	21.6	1,042	14.7	733	10.3	976	13.7
	1970-71	3,088	40.1	1,637	21.2	1,081	14.0	842	10.9	1,060	13.8
	1971-72	3,142	39.5	1,758	22.1	1,181	14.8	711	8.9	1,163	14.6

Table 15.--Summary of sex and age ratios in woodcock wing collection by periods - Central Region

Region	Period	Hunting Season	Sample Size*	Percent of Season Sample	Percent								
					Ad	F	Im	F	Im	M	100	Ad	F
					100	Ad	M	100	Im	M	100	Ad	F
NORTH CENTRAL		1968-69	702	21.4	183			80			166		
	I (to 9/30)	1969-70	761	26.1	128			92			199		
		1970-71	1,013	26.8	163			97			208		
		1971-72	1,043	22.1	156			89			161		
	II (10/1-20)	1968-69	1,541	47.0	176			108			144		
		1969-70	1,618	55.4	195			115			143		
		1970-71	1,926	50.9	201			118			188		
		1971-72	2,125	45.0	215			107			141		
	III (after 10/20)	1968-69	1,037	31.6	153			93			137		
		1969-70	542	18.6	185			102			99		
		1970-71	843	22.3	161			99			188		
		1971-72	1,549	32.8	183			109			125		
MID-CENTRAL		1968-69	212	33.3	149			82			240		
	I (to 10/10)	1969-70	170	31.1	107			113			184		
		1970-71	215	40.5	142			117			166		
		1971-72	117	21.4	152			103			200		
	II (10/11-11/10)	1968-69	354	55.6	181			101			182		
		1969-70	276	50.5	135			68			155		
		1970-71	259	48.8	209			76			207		
		1971-72	303	55.5	122			114			188		
	III (after 11/10)	1968-69	71	11.1	83			61			253		
		1969-70	101	18.5	59			45			263		
		1970-71	58	10.7	180			61			167		
		1971-72	126	23.1	90			76			239		
SOUTH CENTRAL		1968-69	124	19.0	156			61			279		
	I (to 12/10)	1969-70	125	15.1	141			81			232		
		1970-71	39	8.2	162			200			138		
		1971-72	65	14.1	82			56			139		
	II (12/11-1/10)	1968-69	365	55.8	138			112			284		
		1969-70	494	59.5	118			109			319		
		1970-71	306	64.6	125			81			330		
		1971-72	257	55.6	162			116			176		
	III (after 1/10)	1968-69	165	25.2	150			118			177		
		1969-70	211	25.4	163			77			244		
		1970-71	129	27.2	157			124			227		
		1971-72	140	30.3	161			120			149		

*Excluding adult unknowns and unknown sex and age.

Table 16.--Summary of sex and age ratios in woodcock wing collection by periods - Atlantic Region

Region	Period	Hunting Season	Sample Size*	Percent of Season Sample			Im			Im		
				Ad	F	100	Ad	M	100	Im	M	100
NORTH ATLANTIC	I (to 10/10)	1968-69	2,424	27.4	137	100	100	187				
		1969-70	1,938	23.0	156		107	146				
		1970-71	2,140	23.9	174		100	189				
		1971-72	1,941	22.2	168		104	138				
	II (10/11-31)	1968-69	5,405	61.1	143		97	182				
		1969-70	5,359	63.6	144		94	165				
		1970-71	5,434	60.6	149		104	230				
		1971-72	5,341	61.1	159		101	148				
	III (after 10/31)	1968-69	1,015	11.5	128		81	230				
		1969-70	1,129	13.4	96		87	211				
		1970-71	1,393	15.5	123		83	348				
		1971-72	1,462	16.7	95		90	290				
MID-ATLANTIC	I (to 10/20)	1968-69	854	22.4	162		76	140				
		1969-70	794	23.6	155		107	181				
		1970-71	738	23.3	175		109	160				
		1971-72	593	16.9	175		150	192				
	II (10/21-11/20)	1968-69	2,568	67.5	145		99	194				
		1969-70	2,114	62.9	119		96	209				
		1970-71	1,973	62.3	155		108	200				
		1971-72	2,470	70.6	157		114	224				
	III (after 11/20)	1968-69	383	10.1	96		73	686				
		1969-70	455	13.5	80		79	667				
		1970-71	454	14.3	87		87	731				
		1971-72	438	12.5	84		94	623				
SOUTH ATLANTIC	I (to 12/10)	1968-69	74	29.6	95		88	165				
		1969-70	50	24.9	144		87	215				
		1970-71	20	5.0	200		40	350				
		1971-72	73	17.2	144		93	112				
	II (12/11-1/10)	1968-69	131	52.4	161		78	192				
		1969-70	109	54.2	122		103	314				
		1970-71	243	60.1	119		48	250				
		1971-72	171	40.3	86		81	133				
	III (after 1/10)	1968-69	45	18.0	160		138	388				
		1969-70	42	20.9	60		73	433				
		1970-71	141	34.9	91		57	231				
		1971-72	180	42.5	158		84	101				

*Excluding adult unknowns and unknown sex and age.

Table 17.--Distribution of harvest by 10-day periods in Central Region

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	Percent of sample collected during period										PERIOD*				MEDIAN PERIOD OF HARVEST		
			9/1-10	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Percent of sample collected during period (dashes indicate season open but no wings collected)																			
MINN.																			
68-69	9/7	242	6.2	5.8	13.2	20.7	26.9	24.8	2.5									10/11-20	
69-70	9/6	252	6.3	12.3	16.3	13.1	32.9	17.9	1.2									10/11-20	
70-71	9/5	246	5.3	6.1	16.3	21.5	33.3	14.6	2.8									10/1-20	
71-72	9/4	707	5.9	13.3	7.1	18.7	24.3	26.4	4.2									10/11-20	
WIS.																			
68-69	9/14	1,120	2.3	17.0	18.9	33.2	24.4	4.2										10/11-20	
69-70	9/13	1,048	8.1	13.2	18.7	38.1	15.6	5.5	0.8									10/11-20	
70-71	9/12	1,483	10.9	14.9	26.4	25.6	16.7	5.5	0.1									10/1-10	
71-72	9/11	1,680	7.1	5.8	24.3	25.0	33.6	2.6	1.7									10/11-20	
MICH.																			
68-69	9/15**	2,054	9.3	14.3	19.9	23.9	28.4	4.0	0.1									10/11-20	
69-70	9/15**	1,684	11.8	16.4	27.1	28.7	11.7	3.8	0.5									10/1-10	
70-71	9/15**	2,166	12.8	15.3	29.6	20.0	16.6	5.3	0.4									10/1-10	
71-72	9/15**	2,388	14.3	12.8	23.1	19.7	24.0	5.6	0.5									10/1-20	
ILL.																			
68-69	10/1	13	--	--	--	--	30.8	53.8	15.4	--								11/11-20	
69-70	10/1	14	--	--	--	--	21.4	78.6	--	--								11/11-20	
70-71	10/1	4	--	--	--	--	--	50.0	--	--								--	
71-72	10/15	28	--	--	--	--	10.7	57.1	21.4	--								11/11-20	
IND.																			
68-69	9/28	120	10.0	24.2	35.0	20.8	5.8											10/11-20	
69-70	9/20	114	7.0	13.2	6.1	14.9	22.8	24.6	10.5	0.9								10/21-31	
70-71	9/19	63	17.5	25.4	4.8	11.1	25.4	12.7	1.6	1.6								10/11-20	
71-72	9/25	52	--	9.6	21.2	23.1	11.5	28.8	5.8									10/21-31	
OHIO																			
68-69	9/20	487	3.5	13.3	20.7	19.9	20.7	18.3	3.1	0.4								10/11-20	
69-70	9/19	394	11.2	13.7	12.7	22.8	17.3	12.2	10.2	--								10/11-20	
70-71	9/18	434	14.3	11.0	18.4	16.3	22.3	12.4	4.8	0.5								10/11-20	
71-72	9/17	419	9.8	8.6	9.6	18.9	24.3	19.8	9.1									10/21-31	
MO.																			
68-69	10/1	12	--	41.7	--	25.0	33.3	--	--									11/1-10	
69-70	10/1	11	9.1	--	9.1	27.3	45.5	9.1										11/21-30	
70-71	10/1	32	3.1	9.4	25.0	43.8	15.6	3.1	--									11/1-10	
71-72	10/1	12	8.3	--	25.0	50.0	16.7	--										11/11-20	
KY.																			
68-69	11/21	2																11/21-30	
69-70	11/20	7																11/21-30	
70-71	11/19	4																--	
71-72	11/18	0																--	

Table 17.--Distribution of harvest by 10-day periods in Central Region--continued

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD*							PERIOD*							MEDIAN PERIOD OF HARVEST	
			1 9/1-10	2 10/1-10	3 11/1-10	4 12/1-10	5 1/1-10	6 2/1-10	7 3/1-10	8 4/1-10	9 5/1-10	10 6/1-10	11 7/1-10	12 8/1-10	13 9/1-10	14 10/1-10	15 11/1-10	16 12/1-10
Percent of sample collected during period (dashes indicate season open but no wings collected)																		
OKLA.																		
	68-69	11/21	0															
	69-70	11/2	1															11/21-30
	70-71	11/21	4															---
	71-72	11/20	7															12/1-10
ARK.																		
	68-69	11/28	16															12/21-31
	69-70	11/28	40															1/1-10
	70-71	12/1	50															12/24-31
	71-72	12/1	21															12/21-31
TENN.																		
	68-69	11/18	37															11/21-30
	69-70	11/17	24															11/21-30
	70-71	11/26	21															11/21-30
	71-72	11/6	50															11/11-30
TEX.																		
	68-69	11/23	39															1/21-31
	69-70	11/22	94															1/1-10
	70-71	11/21	19															1/1-10
	71-72	11/20	59															1/1-10
LA.																		
	68-69	11/28	500															1/21-31
	69-70	11/27	641															1/1-10
	70-71	11/26	332															1/1-10
	71-72	11/25	307															12/21-31
MISS.																		
	68-69	11/30	83															1/1-10
	69-70	11/28	30															12/21-31
	70-71	12/12	33															1/11-21
	71-72	12/18	37															12/21-31
ALA.																		
	68-69	11/28	42															1/11-20
	69-70	11/28	35															12/21-31
	70-71	12/13	52															1/1-10
	71-72	12/24	43															1/21-31

*Eleven days in last period of 31-day months; eight days in Period 18.

**Later opening in Zone 3 (approximately southern one-third of State).

Table 18.--Distribution of harvest by 10-day periods in Atlantic Region

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD*										PERIOD* 12/1-10	1/1-10	1/1-10 open but no wings collected)	MEDIAN HARVEST		
			1 9/1-10	2 10/1-10	3 10/4	4 10/1-10	5 11/1-10	6 11/1-10	7 11/1-10	8 12/1-10	9 12/1-10	10 1/1-10						
MAINE																		
68-69	9/24	3,495	13.3	24.8	28.7	31.4	1.7	0.1										
69-70	9/24	3,167	12.8	20.5	33.2	30.8	2.0	0.8										
70-71	10/1	3,715	2.	28.9	38.4	3.7	0.4	T										
71-72	9/24**	3,750	2.6	25.6	38.6	28.4	4.5	0.3										
N.Y.																		
68-69	9/23**	2,123	3.4	16.0	32.9	33.8	12.5	1.3	0.2									
69-70	9/22**	2,161	3.3	17.8	32.9	28.8	11.6	5.2	0.5									
70-71	9/21**	2,035	3.5	20.1	24.0	29.1	17.7	4.8	0.8									
71-72	9/20**	1,939	0.9	3.5	17.1	19.6	30.7	24.7	3.0	0.5								
VT.																		
68-69	9/28	663	14.2	26.1	29.4	25.9	3.9	0.5	--	--								
69-70	9/27	395	9.9	26.8	46.3	14.9	1.8	0.3	--									
70-71	9/26	611	8.3	29.1	25.9	24.1	11.8	0.6	0.2									
71-72	9/25	893	13.0	13.2	26.4	39.4	7.6	0.3	--									
N.H.																		
68-69	10/1	1,451	32.9	28.4	26.2	12.3	0.1	--	--									
69-70	10/1	1,026	28.2	38.5	22.3	9.8	1.2	--	--									
70-71	10/1	1,185	28.0	25.1	29.8	16.9	0.1	0.2	--									
71-72	10/1	850	28.2	34.1	30.1	7.4	0.1	--	--									
MASS.																		
68-69	10/10	730	7.9	30.4	42.6	16.8	1.6	0.5										
69-70	10/10	1,033	6.1	36.6	36.4	11.5	8.1	1.3										
70-71	10/10	749	11.1	36.2	37.0	12.0	3.1	0.7										
71-72	10/10	709	41.3	32.2	19.5	6.2	0.8											
CONN.																		
68-69	10/19	647	7.4	50.7	32.1	4.5	4.6	0.5	--	0.2								
69-70	10/18	859	11.2	51.2	23.6	10.8	2.7	0.5	--									
70-71	10/17	825	20.2	37.0	23.4	14.5	3.8	1.1	--									
71-72	10/16	581	11.0	23.8	26.7	28.7	7.6	1.0	1.2									
R.I.																		
68-69	10/26	112	39.3	47.3	4.5	8.9	--	--	--									
69-70	10/25	56	35.7	39.3	10.7	12.5	1.2	--	--									
70-71	10/24	65	33.8	46.2	7.7	7.7	3.1	--	1.5									
71-72	10/23	81	50.6	17.3	13.6	3.7	--	1.2	--									
PA.																		
68-69	10/12	1,419	31.2	39.7	22.4	4.3	2.3	--	--									
69-70	10/18	1,040	25.5	42.9	19.1	9.4	3.1	--	--									
70-71	10/17	1,114	22.4	41.1	24.7	8.6	3.1	--	--									
71-72	10/16	1,140	22.5	28.9	32.3	15.3	1.1	--	--									
N.J.																		
68-69	10/5	2,261	10.3	8.5	25.5	29.6	13.5	10.5	2.0									
69-70	10/4	2,102	10.8	14.1	29.1	20.6	11.8	9.4	4.0									
70-71	10/3	1,609	12.1	17.0	23.9	21.4	14.1	8.9	2.6									
71-72	10/2	1,799	6.7	9.2	11.0	35.2	24.5	10.8	2.6									

Table 18.--Distribution of harvest by 10-day periods in Atlantic Region--continued

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD*										MEDIAN PERIOD OF HARVEST					
			1 9/1-10	2 10/1-10	3 10/1-10	4 11/1-10	5 11/1-10	6 11/1-10	7 11/1-10	8 12/1-10	9 12/1-10	10 1/1-10						
Percent of sample collected during period (dashes indicate season open but no wings collected)																		
W. VA.																		
68-69	10/12**	71																
69-70	10/11**	80																
70-71	10/10**	159	0.6	3.8	6.3	10.7	30.8	25.8	18.9	3.1	--	--	--	--	--	--	--	--
71-72	10/16	244																
MD.																		
68-69	10/16	128																
69-70	10/10	122	--															
70-71	10/9	176	1.1															
71-72	10/5	210	1.0	3.8	8.1	13.8	34.8	31.0	7.6	--	--	--	--	--	--	--	--	--
DEL.																		
68-69	11/22	22																
69-70	11/21	11																
70-71	11/20	32																
71-72	11/19	56																
VA.																		
68-69	11/18	42																
69-70	11/17	113																
70-71	11/16	166																
71-72	11/15	84																
N.C.																		
68-69	11/16	66																
69-70	11/28	55																
70-71	12/11	209																
71-72	12/11	133																
S.C.																		
68-69	11/28	119																
69-70	11/28	81																
70-71	12/13	67																
71-72	12/24	114																
GA.																		
68-69	11/28	50																
69-70	11/20	40																
70-71	11/20	101																
71-72	11/20	137																
FLA.																		
68-69	11/9	18																
69-70	11/15	29																
70-71	11/21	31																
71-72	11/20	18																

*Eleven days in last period of 31-day months; eight days in Period 18.

**Later opening in southern part of State.

***Except for special 8-day early season in late September.

Table 19.--Distribution of 1969-70, 1970-71, and 1971-72 wing collections by 7-day periods* - Central Region

State	Year	Opening Date	Sample Size	Percent of harvest in single period								Percent of harvest in combined periods	
				1	2	3	4	5	6	7	8		
Ala.	1969-70	11-28	34	17.6	2.9	8.8	20.6	--	20.6	5.9	17.6	5.9	--
	1970-71	12-13	51	21.6	2.0	15.7	23.5	3.9	3.9	2.0	19.6	5.9	2.0
	1971-72	12-24	42	11.9	14.3	9.5	11.9	4.8	4.8	9.5	9.5	19.0	4.8
													26.2
Ark.	1969-70	11-28	40	--	--	25.0	10.0	12.5	7.5	20.0	10.0	5.0	0
	1970-71	12-1	56	23.2	14.3	3.6	7.1	21.4	5.4	8.9	--	14.3	1.8
	1971-72	12-1	21	9.5	4.8	28.6	23.8	19.0	4.8	4.8	--	4.8	37.5
													14.3
Ill.	1969-70	10-1	14	--	--	25.0	25.0	--	--	78.6	--	--	--
	1970-71	10-1	4	--	7.1	10.7	--	--	--	50.0	--	--	25.0
	1971-72	10-15	28	3.6	7.1	10.7	--	53.6	3.6	21.4	--	--	Closed
													10.7
Ind.	1969-70	9-20	115	8.7	13.9	3.5	3.5	13.0	20.9	14.8	13.0	8.7	--
	1970-71	9-19	60	33.3	6.7	3.3	6.7	8.3	16.7	11.7	10.0	1.7	1.7
	1971-72	9-25	52	--	7.7	13.5	9.6	21.2	7.7	9.6	11.5	19.2	--
													7.7
Ky.	1969-70	11-20	7	85.7	14.3	--	--	--	--	--	--	--	100.0
	1970-71	11-19	4	25.0	75.0	--	--	--	--	--	--	--	--
	1971-72	11-18	0	--	--	--	--	--	--	--	--	--	--
													--
La.	1969-70	11-27	641	6.6	7.6	9.2	9.4	16.7	18.7	12.6	10.0	8.1	1.1
	1970-71	12-9	332	3.9**	7.5	18.4	22.3	17.8	9.0	5.1	11.1	1.8	3.0
	1971-72	11-25	307	6.2	7.8	12.7	11.1	19.2	5.5	15.0	7.8	12.4	2.3
													14.0
Mich.	1969-70	9-15	1,684	14.7	10.6	19.1	17.0	18.6	13.8	3.7	1.9	0.5	Closed
	1970-71	9-15	2,165	13.8	12.0	17.3	19.4	13.4	13.6	6.8	3.3	0.4	Closed
	1971-72	9-15	2,385	15.4	9.5	12.2	16.9	14.1	15.8	11.2	4.2	0.7	Closed
													24.9
Minn.	1969-70	9-6	252	8.3	8.7	5.6	14.3	11.1	25.8	13.5	11.5	1.2	--
	1970-71	9-5	246	5.3	4.1	15.0	13.4	26.0	17.9	8.1	4.9	--	17.1
	1971-72	9-4	707	5.9	4.2	11.5	5.4	11.9	17.3	18.5	18.7	6.2	0.4
													10.2

Table 19.--Distribution of 1969-70, 1970-71, and 1971-72 wing collections by 7-day periods* - Central Region
--continued

State	Year	Opening Date	Sample Size	Percent of harvest in single period							Percent of harvest in combined periods						
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10	
Miss.	1969-70	11-28	32	--	9.4	3.1	37.5	21.9	12.5	3.1	12.5	--	--	9.4	75.0	15.6	
	1970-71	12-12	33	--	6.1	18.2	12.1	6.1	24.2	6.1	12.1	3.0	6.1	48.5	45.5		
	1971-72	12-18	37	46.0	8.1	5.4	2.7	2.7	10.8	2.7	8.1	5.4	8.1	54.1	21.6	24.3	
Mo.	1969-70	10-1	11	9.1	--	--	9.4	15.6	34.4	18.8	12.5	6.2	--	--	3.1	78.1	18.8
	1970-71	10-1	32	3.1	--	--	9.4	15.6	34.4	18.8	12.5	6.2	--	--	8.3	58.3	33.3
	1971-72	10-1	12	8.3	--	--	8.3	8.3	50.0	16.7	--	16.7	--	--	--	--	--
Ohio	1969-70	9-19	394	19.0	8.4	5.8	15.7	17.0	10.1	7.1	11.9	4.8	--	27.4	48.7	48.7	
	1970-71	9-18	435	17.5	12.0	9.7	9.4	12.9	13.8	12.9	7.4	4.1	0.5	29.4	45.7	23.9	
	1971-72	9-17	419	13.1	5.2	5.2	13.6	14.1	12.2	18.1	10.0	6.7	1.7	18.4	45.1	24.8	
Okla.	1969-70	11-2	1	--	--	100.0	--	--	--	--	--	--	--	--	100.0	--	--
	1970-71	11-21	4	25.0	50.0	--	--	25.0	--	--	--	--	--	Closed	75.0	25.0	--
	1971-72	11-20	7	14.3	28.6	14.3	--	14.3	14.3	14.3	--	Closed	Closed	42.9	42.9	14.3	
Tenn.	1969-70	11-17	47	72.3	12.8	2.1	--	6.4	--	--	--	4.3	2.1	85.1	8.5	6.4	
	1970-71	11-26	21	76.2	9.5	4.8	--	4.8	--	--	4.8	--	--	85.7	9.5	4.8	
	1971-72	11-6	50	22.0	26.0	26.0	14.0	4.0	4.0	4.0	--	--	--	48.0	48.0	4.0	
Tex.	1969-70	11-22	94	5.3	14.9	--	13.8	5.3	10.6	5.3	19.1	20.2	5.3	20.2	29.8	50.0	
	1970-71	11-21	20	5.0	20.0	10.0	10.0	--	5.0	20.0	5.0	--	25.0	25.0	25.0	50.0	
	1971-72	11-20	59	--	8.5	5.1	10.2	11.9	8.5	6.8	20.3	23.7	5.1	8.5	35.6	55.9	
Wis.	1969-70	9-13	1,049	6.8	7.1	9.8	16.3	22.7	21.5	9.4	4.2	1.6	0.5	13.9	70.4	15.7	
	1970-71	9-12	1,480	7.4	6.6	12.6	17.5	23.0	15.0	10.3	5.8	1.7	0.1	14.0	68.2	17.8	
	1971-72	9-11	1,680	4.6	4.2	4.1	12.3	22.6	19.3	18.9	11.9	1.0	1.3	8.8	58.2	33.0	

*First period begins on season opening date; 10th period 2 days or less.
**Four-day period Nov. 26-29 only.

Table 20.--Distribution of 1969-70, 1970-71, and 1971-72 wing collections by 7-day periods* - Atlantic Region

State	Year	Opening Date	Sample Size	Percent of harvest in single period						Percent of harvest in combined periods			
				1	2	3	4	5	6	7	8	9	10
Conn.	1969-70	10-18	856	29.4	32.8	16.5	12.6	5.6	2.3	0.5	0.2	--	--
	1970-71	10-17	821	27.3	23.0	18.6	17.4	8.2	3.3	1.1	0.5	--	0.6
	1971-72	10-16	581	15.1	15.8	15.0	19.8	18.8	11.2	2.8	0.3	0.9	0.3
Del.	1969-70	11-21	11	54.5	27.3	18.2	--	--	--	--	--	--	81.8
	1970-71	11-20	32	18.8	12.5	6.2	--	21.9	15.6	9.4	6.2	9.4	--
	1971-72	11-19	56	26.8	25.0	5.4	7.1	1.8	1.8	12.5	10.7	8.9	--
Fla.	1969-70	11-15	29	3.4	10.3	3.4	6.9	10.3	3.4	20.7	27.6	13.8	--
	1970-71	11-21	31	--	9.7	3.2	9.7	16.1	29.0	9.7	12.9	3.2	6.5
	1971-72	11-20	18	--	11.1	5.6	5.6	27.8	16.7	11.1	--	16.7	5.6
Ga.	1969-70	11-20	40	12.5	15.0	20.0	12.5	--	12.5	7.5	10.0	10.0	--
	1970-71	11-20	106	7.5	4.7	3.8	11.3	13.2	19.8	14.2	6.6	8.5	10.4
	1971-72	11-20	135	11.9	2.2	31.9	10.4	13.3	4.4	13.3	3.0	7.4	2.2
Maine	1969-70	9-24	3,161	12.6	14.1	17.5	26.6	19.5	8.1	1.0	0.6	Closed	26.7
	1970-71	10-1	3,715	18.5	20.1	23.2	24.3	11.4	2.1	0.2	0.2	--	Closed
	1971-72	9-24	3,750	2.6	16.3	28.5	22.5	20.0	7.9	1.9	0.3	Closed	18.9
Md.	1969-70	10-10	122	3.3	8.2	18.0	15.6	12.3	11.5	8.2	13.9	8.2	0.8
	1970-71	10-9	176	1.7	6.8	13.6	17.6	15.9	9.1	14.2	8.5	8.5	4.0
	1971-72	10-5	210	1.9	1.0	4.3	9.0	7.1	18.6	29.5	20.0	7.1	1.4
Mass.	1969-70	10-10	1,032	29.6	23.5	23.0	11.2	6.7	4.7	1.0	0.3	Closed	53.1
	1970-71	10-10	753	31.5	24.2	24.0	10.2	8.5	0.5	0.7	0.4	Closed	55.6
	1971-72	10-10	709	31.5	20.7	21.3	14.0	8.0	3.7	0.8	--	Closed	52.2
N.H.	1969-70	10-1	1,026	23.6	18.9	25.8	16.1	11.3	3.1	1.2	--	Closed	42.5
	1970-71	10-1	1,185	20.5	16.4	18.8	19.1	16.0	8.9	0.1	0.1	Closed	36.9
	1971-72	10-1	850	20.7	17.6	26.5	18.3	12.9	3.8	--	0.1	--	38.4
N.J.	1969-70	10-4	2,102	10.8	8.4	14.0	20.8	15.5	8.9	10.1	6.7	3.6	1.2
	1970-71	10-3	1,612	9.4	7.3	16.9	15.7	12.6	17.4	9.1	6.7	3.7	1.3
	1971-72	10-2	1,799	4.4	7.5	4.6	6.9	21.3	20.9	17.7	9.9	5.7	1.0

Table 20.-Distribution of 1969-70, 1970-71, and 1971-72 wing collections by 7-day periods* - Atlantic Region
--continued

State	Year	Opening Date	Sample Size	Percent of harvest in single period							Percent of harvest in combined periods			
				1	2	3	4	5	6	7	8	9	10	1&2
N.Y.	1969-70	9-22	2,161	2.9	12.4	13.9	21.1	24.6	11.9	7.0	4.7	1.3	0.1	15.3
	1970-71	9-21	2,035	2.8	12.1	11.4	14.3	21.7	17.3	12.8	5.2	2.1	0.1	15.0
	1971-72	9-20	1,939	4.1	6.9	10.5	14.5	15.3	20.6	22.0	4.9	1.3	--	10.9
N.C.	1969-70	11-28	53	7.5	20.8	3.8	22.6	13.2	7.5	18.9	1.9	1.9	28.3	47.2
	1970-71	12-11	209	8.6	12.9	14.8	14.3	7.2	7.2	12.0	15.3	5.3	2.4	21.5
	1971-72	12-11	133	8.3	19.5	4.5	9.8	7.5	11.3	5.3	6.8	19.5	7.5	43.5
Pa.	1969-70	10-18	1,032	47.0	20.7	14.2	11.1	4.9	1.6	0.4	--	--	--	27.8
	1970-71	10-17	1,107	32.3	23.2	25.2	11.3	4.8	2.7	0.5	--	--	--	33.1
	1971-72	10-16	1,137	27.3	17.8	25.9	16.8	8.4	3.7	0.3	--	--	--	39.1
R.I.	1969-70	10-25	56	35.7	25.0	14.3	10.7	12.5	1.8	Closed	--	--	--	67.7
	1970-71	10-24	65	29.2	15.4	40.0	3.1	6.2	4.6	Closed	--	--	--	55.6
	1971-72	10-23	81	39.5	14.8	21.0	6.2	3.7	9.9	3.7	--	1.2	--	45.0
S.C.	1969-70	11-28	81	4.9	6.2	14.8	13.6	4.9	13.6	12.3	14.8	11.1	3.7	11.1
	1970-71	12-13	66	9.1	16.7	13.6	10.6	10.6	16.7	4.5	4.5	3.0	10.6	44.6
	1971-72	12-24	109	9.2	5.5	7.3	8.3	9.2	5.5	14.7	17.4	20.2	2.8	53.8
Vt.	1969-70	9-27	393	14.8	21.6	28.5	22.1	10.9	1.8	0.3	--	--	--	42.0
	1970-71	9-26	609	10.2	21.7	18.7	18.1	14.8	13.8	2.6	--	0.2	--	31.9
	1971-72	9-25	888	13.3	9.9	11.0	24.4	26.5	10.8	3.7	0.3	--	--	23.2
Va.	1969-70	11-17	113	20.4	19.5	13.3	14.2	15.0	0.9	3.5	--	9.7	3.5	39.8
	1970-71	11-16	168	8.3	17.9	6.0	15.5	7.1	14.9	1.8	7.1	13.7	7.7	43.4
	1971-72	11-15	84	39.3	8.3	22.6	10.7	1.2	2.4	2.4	6.0	4.8	47.6	16.8
W. Va.	1969-70	10-11**	80	10.0	20.0	20.0	17.5	30.0	2.5	--	--	Closed	30.0	70.0
	1970-71	10-10**	147	8.8	9.5	22.4	19.0	27.2	9.5	3.4	--	Closed	18.4	28.2
	1971-72	10-16	243	21.0	11.1	25.9	19.3	12.8	7.8	2.1	--	--	32.1	3.4

*First period begins on season opening date; 10th period 2 days or less.

**Excluding special 8-day season in September.

Table 21.--Bureau-funded woodcock research in progress in FY 1972 in the United States*

Organization	Activity	-	Annual Allotment	Duration (Years)	Scheduled Expiration (Fiscal Year)
Bureau of Sport Fisheries and Wildlife					
Orono Field Station	Habitat, banding, and behavioral studies**	\$25,000	Long term	Indefinite	
Moosehorn NWR	Banding and habitat studies	5,000	Long term	Indefinite	
Connecticut	Breeding ground banding**	2,400	3	1974	
Maine	Breeding ground banding**	5,250	5	1972	
Michigan	Breeding biology	4,400	1	1972**	
Minnesota	Behavioral studies (telemetry) **	14,000	3	1972	
New York	Breeding ground banding**	7,650	5	1972**	
Pennsylvania	Breeding ground banding**	5,250	5	1972**	
West Virginia	Breeding ground banding**	5,250	5	1972**	
	Parasite studies**	6,000	3	1973	
Wisconsin	Breeding ground banding**	5,250	5	1972	

*In addition, the following Provinces and States are supporting projects under one or more of the activities listed, from their own resources and/or (in the States) Federal Aid Funds: Illinois, Massachusetts, Michigan, Mississippi, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Virginia, and West Virginia.

**Funds made available through the Accelerated Research Program for Shore and Upland Migratory Game Birds.

***To be extended.

Table 22.--Woodcock banding by States, 1961-71 (excluding experimental birds)

LOCATION	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	11-YR TOTAL
ATLANTIC REG.												
Conn.				1					1	2	22	23
Fla.		1							4			49
Ga.					1				4			6
Maine	35	263	515	457	301	471	549	732	828	866	1,244	6,261
Md. & D.C.	4	6	22	12	16	13	7	5	2	4	9	100
Mass.	1	5	1	5	1	8	121		4	31	166	343
N.B.				17	5				261	191	263	737
N.H.							4	5			1	10
N.J.	9	6	13	12	7	13	4	645	345	556	452	2,062
N.Y.	8	9	15	20	9	19	8	14	485	479	762	1,828
N.C.	1	1							3			6
N.S.					34				1		1	43
Pa.	19	45	51	9	6	9	5	36	38	69	54	341
P.E.I.	1			2								2
R.I.				1								32
S.C.		2										11
Vt.						1	1	2	7	1	3	4
Va.	1	1	8	16	103	301	434	3	7	6	4	14
W. Va.	3				449	843	1,135	1,968	516	249	291	207
REGIONAL TOTAL	84	337	628	584	449	301	434	3	7	2	2,128	13,982
CENTRAL REG.												
Ala.				2	2				2	2	1	7
Ill.	1		2	1	5	8		2	3	4	9	24
Ind.		1	3	1	5	3			76	69	17	177
Iowa		2	2,549	815	1,230	900	1,076	472		3	1	20
La.	748	292	2,549	355	365	396	868	403		521	329	8,932
Mich.	51	50	124	79	4	17	79	111		397	472	3,560
Minn.		1	13	8		6	1	146		58	94	380
Miss.		1	6							132	98	377
Ohio										12	16	58
Okla.												1
Ont.	6	12	10	20	41	14	22	19	26	9	19	198
Tenn.	1		1	1	1	1	1	3		1		9
Tex.												1
Wis.	8	9	19	31	20	27	22	281	185	473	599	1,674
REGIONAL TOTAL	67	824	472	2,700	1,251	1,647	1,368	2,332	1,429	1,676	1,661	15,427
COMB. TOTAL	151	1,161	1,100	3,284	1,700	2,490	2,503	4,300	3,668	4,202	4,850	29,409

Table 23.—Summary of woodcock band recovery file through October 19, 1972 (excluding How Obtained Code 99, recaptured season of banding)

State or Province of Recovery	ATLANTIC REGION						CENTRAL REGION						Region Total											
	Conn.	Maine	Md.	Mass.	N.B.	N.H.	N.J.	N.Y.	N.S.	Pa.	Vt.	W.Va.	Ala.	Ind.	Ia.	Mich.	Minn.	Miss.	Ohio	Ont.	Wis.			
ATLANTIC REGION	Conn.	18	1	3	4	1	1	32	2	2	4	2	4	1	7	8	6	34	2	356				
Conn.	4	18	1	3	4	1	1	2	2	1	1	2	1	1	7	8	6	34	2	356				
Del.	1	1	1	1	1	1	1	2	2	1	1	2	1	1	7	8	6	34	2	356				
Fla.	4	9	1	1	1	1	1	2	2	1	1	2	1	1	7	8	6	34	2	356				
Ga.	336	3	4	1	1	1	1	2	2	1	1	2	1	1	7	8	6	34	2	356				
Maine	4	2	2	1	1	1	1	2	2	1	1	2	1	1	7	8	6	34	2	356				
Md.	17	96	47	1	1	1	1	2	1	1	1	1	1	1	7	8	6	34	2	356				
Mass.	12	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.B.	10	3	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.H.	21	4	6	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.J.	15	1	2	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.Y.	15	2	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.C.	18	1	2	4	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
N.S.	9	2	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
Pa.	13	4	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
Que.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
S.C.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
Vt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
Va.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	6	34	2	356				
W. Va.	503	6	122	70	2	110	83	9	57	1	455	1,422	1	1	94	5	1	1	3	106	1,228			
Subtotal	4	503	6	122	70	2	110	83	9	57	1	455	1,422	1	1	94	5	1	1	3	106	1,228		
CENTRAL REGION																								
Ala.	1									2	2				15	5	2	2	1	25	31			
Ark.															18	6	1	1	4	6	6			
Ill.															6	1	1	1	1	10	10			
Ind.															6	1	1	1	1	11	11			
Iowa															9	1	1	1	1	11	11			
Ky.	1	1	3												183	14	1	1	1	8	209			
La.	8	1	3												1	122	339	16	1	3	466			
Mich.															13	1	1	1	1	30 <th>30</th>	30			
Minn.	1	1	2	1	1	1	1	4	10						7	1	1	1	1	17	17			
Miss.															7	1	1	1	1	8	8			
Mo.															12	1	1	1	1	15	18			
Ohio	1														12	1	3	1	1	1	1			
Okla.															1	18	5	5	1	24	26			
Ont.															5	1	1	1	1	6	10			
Tenn.	3														5	1	1	1	1	3	5			
Tex.	2														2	2	2	1	1	3	3			
Wis.															17	2	3	9	31	83	83			
Subtotal		520	6	124	73	2	115	89	9	58	1	467	1,468	1	7	567	365	19	7	4	12	53	1,035	2,503
Total	4	520	6	124	73	2	115	89	9	58	1	467	1,468	1	7	567	365	19	7	4	12	53	1,035	2,503

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of this department of natural resources.

The Department works to assure the wisest choice in managing all our resources so that each shall make its full contribution to a better United States now and in the future.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
WASHINGTON, D. C. 20240

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
INT 423

